

THE  
IMMUNIZATION  
PROGRAMME  
IN INDIA

A Handbook for Medical Officers

by

Jotna Sokhey  
Indra Bhargava  
R N Basu



Government of India  
Ministry of Health & Family Welfare  
New Delhi

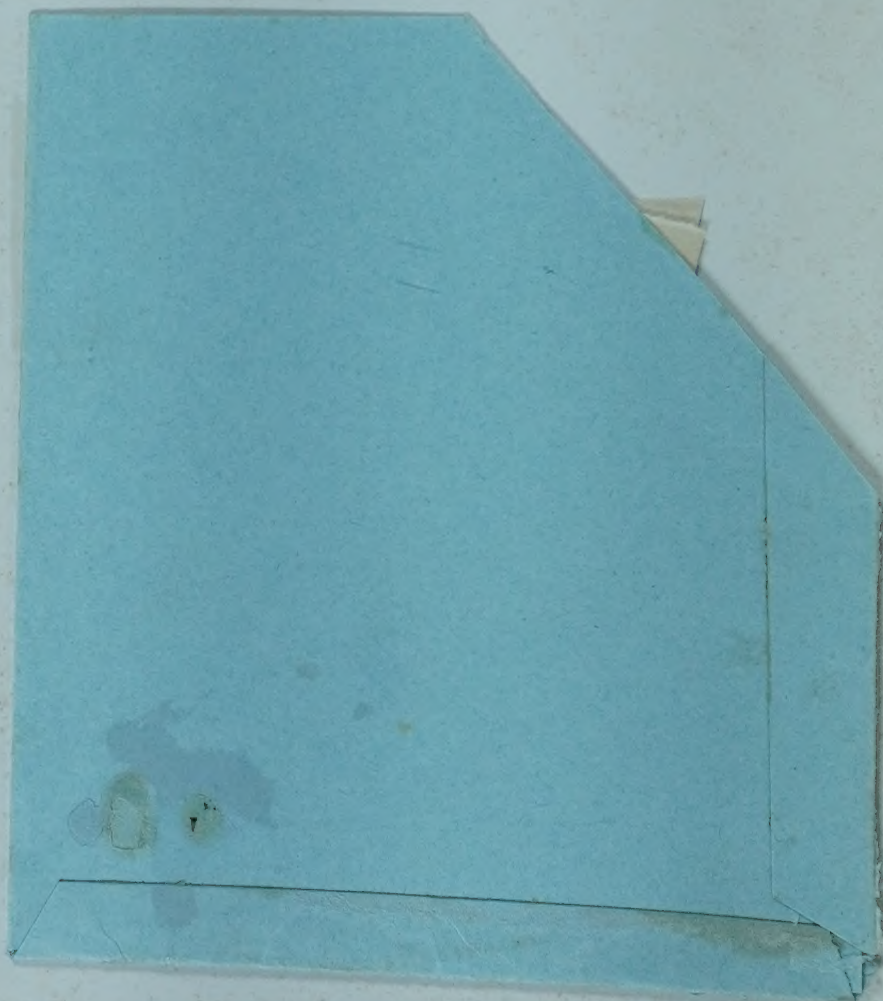
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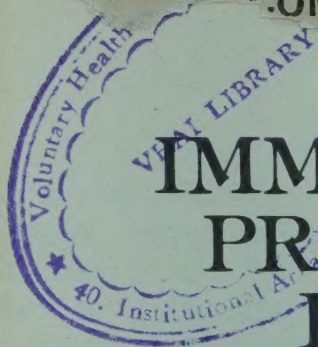
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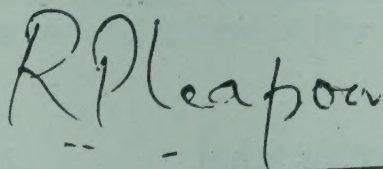


## FOREWORD

National effort in Health Care during 35 years of our independent existence has witnessed a rapid decline in mortality rate: from 27.4 in 1951 to 12.5 per thousand population in 1981. Infant mortality rate, however, still remains very high: 114 per thousand. This is unacceptably high. National Health policy aims at bringing down the infant mortality to below 60 per thousand live births by 2000.

Infectious diseases are a major cause of morbidity and mortality in children. Incidence of these diseases can be reduced dramatically by immunization. We have, therefore, launched Expanded Programme on Immunization which seeks to cover 85% of infant population by 1990/91. Success of the programme is dependent on managerial and medical aspects. The basic technology regarding management of the programme and role of general duty doctor has not been documented in a readily digestible manner. This handbook attempts to meet this felt need. It provides a blend of inputs of academic and operational aspects based on the field experiences. This book could serve as a guide for organising programme of intensive immunization coverage for all the infants in selected districts. It is expected that the approach will lead to an evolution of a methodology resulting in total coverage in wider areas and ultimately in the entire country.

It is hoped that the handbook will not only help in achieving this objective but will activate the general duty doctors towards more intensive efforts for a better vaccination coverage of the children.

A handwritten signature in dark ink, reading 'R.P. Kapoor'. The signature is written in a cursive, flowing style. Below the signature is a horizontal line.

(R.P. Kapoor)  
Additional Secretary  
and Commissioner (FW)

New Delhi  
October 8, 1984

# FOREWORD

The first of the two volumes of this work is a history of the development of the theory of the structure of matter. It is a history of the ideas which have been advanced by the physicists of the last century and a half, and of the experiments which have been devised to test these ideas. The second volume is a history of the development of the theory of the structure of matter. It is a history of the ideas which have been advanced by the physicists of the last century and a half, and of the experiments which have been devised to test these ideas.

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## PREFACE

Immunization in the broadest sense consists of three phases—administration of vaccines to the children, immune response in the child who has received the vaccine and a reduction of the disease in the community.

This requires a considerable amount of preparatory work in the community, planning the production of vaccines, procurement of supplies, their storage and distribution, development of an information system and feedback. These activities are based on a relatively new addition to the knowledge which has yet to find a place in the medical textbooks. An attempt to bridge this gap in knowledge has been made by providing a combination of the academic and operational aspects with a suitable blend of field experience in this handbook. Preparation of this handbook has drawn liberally not only on source materials in different fields but has an abundant and often unrecognised contribution of the experience and expertise of field workers at different levels in the country working against many odds and constraints, including the paucity of the six 'M's—manpower, material, money, management procedures, mobility and motivation.

We would like to express our profound sense of gratitude to these workers and our colleagues for this magnificent contribution.

Encouraged by the good response to the earlier version "The Immunization Programme in India"—a handbook for medical officers, from which it is largely adapted, a revised edition is now being brought out. We shall like to express our gratitude to UNICEF, India for bringing out the second edition of this book.

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# **I. BACKGROUND INFORMATION**

## **1. The Immunization Programme in India**

The major causes of sickness and death of children in India are infectious diseases many of which are preventable by immunization. In addition to those who become ill or die, many are disabled for life by complications following these illnesses. Neonatal tetanus remains a major cause of neonatal mortality in many parts of the country, specially in the rural areas. Poliomyelitis is the single major cause of lameness in children under five years. A large number of cases of diphtheria, pertussis, tetanus, tuberculosis and typhoid fever are also reported annually.

This should not happen; since safe and effective vaccines are available for the control of the above mentioned diseases. The Government of India started the Expanded Programme on Immunization (EPI) in 1978 with the objective of reducing the morbidity and mortality due to diphtheria, pertussis, tetanus, poliomyelitis, tuberculosis and typhoid fever by making vaccination services available to all eligible children and pregnant women by 1990. Other diseases will be included when and where necessary. It was also aimed to achieve self-sufficiency in the production of vaccines required for the programme.

It was resolved at the fourth meeting of the Central Council of Health and Family Welfare held in January 1978, that the state governments would initiate the expanded programme on immunization and that the Government of India (GOI) would assist the states by supplying vaccines and cold storage equipment, training health personnel and periodic evaluation of the programme.



The proposed vaccination coverage of the eligible population from 1980 to 2000 as defined in the National Health Policy is as follows:

| Beneficiaries   | Vaccine | Percentage coverage |      |      |      |      |
|-----------------|---------|---------------------|------|------|------|------|
|                 |         | 1980                | 1985 | 1990 | 1995 | 2000 |
| Infants         | DPT     | 25                  | 70   | 85   | 85   | 85   |
|                 | Polio   | 5                   | 45   | 85   | 85   | 85   |
|                 | BCG     | 65                  | 70   | 70   | 85   | 85   |
| School Children |         |                     |      |      |      |      |
| 5-6 years       | DT      | 20                  | 80   | 85*  | 85*  | 85*  |
| 5-6 years       | Typhoid | 2                   | 70   | 85   | 85   | 85   |
| 10 years        | T T     | —                   | 40   | 100* | 100* | 100* |
| 16 years        | T T     | —                   | 60   | 100* | 100* | 100* |
| Pregnant women  | T T     | 20                  | 60   | 100  | 100  | 100  |

\*booster dose

Vaccination stimulates the defensive mechanisms of the body and leads to the development of active immunity and protection against further attacks of the particular disease. The vaccination coverage of the eligible population should therefore result in the reduction of the disease incidence in the community. However, to be effective, a full course of the potent vaccine must be given at the right age by the right technique.

One of the major difficulties in the rapid expansion of the programme is the storage and distribution of vaccines at the recommended temperatures. The vaccines must not only be supplied regularly to a very large number of vaccination centres spread all over the country covering large distances, but also services have to be provided in places without electricity or which have frequent power failures. Vaccines have relatively short shelf life and become ineffective if exposed to excessive heat or cold.

The immunization programme is a complex one, requiring a close coordination of work between personnel engaged in various tasks at different levels. The tasks must not only be done correctly but also in time in relation to each other. It is, therefore, very important that people are not only aware of their job



responsibilities but are well trained and motivated also. Even if one person in the team does not do his work properly, the efforts put in by others may also go waste.

Various aspects of the immunization programme must be strengthened simultaneously since each has an equal bearing for the success of the programme. Some of the major tasks are listed below:

- \* Integration of vaccination services so that all the vaccines are available at each vaccination session to reduce the number of contacts to the minimum.
- \* Measures to expand the vaccination coverage of the eligible population.
- \* Production, quality control and supply of vaccines.
- \* Strengthening the cold chain for vaccines.
- \* Development of a reliable surveillance system.
- \* Training of health personnel.
- \* Preparation of health education and publicity material.
- \* Promotion of community participation.
- \* Procurement and distribution of essential supplies and equipment.
- \* Operational research.
- \* Evaluation and monitoring.

## **2. Immunization schedule**

Each country frames its own immunization schedule keeping in view the epidemiological pattern of the diseases, the types of vaccines available and the administrative and economic feasibility of providing the services. The following schedule is recommended in the country:

| Beneficiaries  | Age          | Vaccine  | No. of doses |
|----------------|--------------|----------|--------------|
| Infants        | 3-9 months   | DPT      | 3            |
|                |              | Polio    | 3            |
|                |              | BCG      | 1            |
|                | 9-12 months  | Measles* | 1            |
|                | 18-24 months | DPT      | 1 (booster)  |
|                |              | Polio    | 1 (booster)  |
| Children       | 5-6 years    | DT       | 1**          |
|                |              | Typhoid  | 2            |
|                | 10 years     | TT       | 1**          |
|                |              | Typhoid  | 1**          |
|                | 16 years     | TT       | 1**          |
|                |              | Typhoid  | 1**          |
| Pregnant women | 16-36 week   | TT       | 1**          |

\* Measles vaccine is available only at selected centres.

\*\* Booster. Give two doses if not vaccinated previously.

## NOTE

\* Interval between doses should not be less than one month.

\* Minor coughs, colds and mild fever are not a contra-indication for vaccination.

\* The recommended course of each vaccine must be completed as early as possible. If for some reason, the child did not get the scheduled dose in time (within 4 to 8 weeks) he may be given the dose as soon as this is possible without starting the course again.

\* DPT and Polio vaccines are given to the child at the same time. BCG vaccine can be given with any one of the three doses but the sites of the injections of the DPT and BCG vaccines should be different.



### **3. Contraindications and reactions**

3.1 Vaccines are an effective, safe and relatively cheap tool for the control of many infectious diseases. The decision to withhold immunization from any child should not be taken lightly since the longer the completion of the schedule is delayed, the longer the child is exposed to the risk of getting the diseases. In areas where health services are limited and the morbidity and mortality from vaccine preventable diseases are high, children should be immunized as early as possible.

Malnutrition, low-grade fever, mild respiratory infections or diarrhoea and other minor illnesses are not a contraindication to vaccination. Diarrhoea should not be considered a contraindication to OPV, but to ensure full protection, doses given to children with diarrhoea should not be counted as part of the series and the child should be given another dose at the first available opportunity.

Immunization of children so ill as to require hospitalization, and those with high grade fever or otherwise acutely ill may be deferred till a decision is taken by a medical officer. The immunization status of hospitalized children should be checked and they should be given the appropriate immunization before discharge if they had not been vaccinated previously.

A second or third DPT injection should not be given to a child who had a severe adverse reaction to the previous dose. Instead a single dose of DT vaccine may be given.

The health workers should be asked to consult the medical officer in case of doubt.

### **3.2 Reactions**

Despite the safety of vaccines used in EPI, complications can sometimes occur. Although their rates are difficult to estimate precisely, it is known that they are far less frequent than the complications caused by the diseases themselves.

Reactions after vaccination are in general mild and of a short duration. These may be :

- \* Mild fever
- \* Local pain and swelling at the site of injection
- \* Malaise, fretfulness
- \* Transient rash (after measles vaccine)
- \* A lump or papule appears in the third or fourth week after BCG vaccination. It is generally not painful but is tender to touch. The

papule increases in size to 6 to 10 mm in diameter by the sixth week. The nodule softens with the formation of pus. No treatment is necessary. At the end of 10 to 12 weeks only a small scar is visible.

In rare cases convulsions or collapse after DPT vaccination have been observed. In such cases further doses of DPT should be stopped and medical officer consulted. DPT vaccine should be limited to children under two and DT vaccine to children under six as the severity of the reactions may increase in the older age groups. These vaccines are, in any case, not indicated in such children from epidemiological point of view.

Abscess formation is usually due to the use of unsterilized or inadequately sterilized syringes and needles. The injections are painful if blunt or barbed needles are used.

The parents should be informed of the expected side-effects so that they do not worry. If there is any anxiety they should be encouraged to return to the health centre for consultation.

#### 4. Estimation of eligibles

The basic data required for preparing estimates of the number of the pregnant women, infants and children at 5, 10 and 16 years are :

- \* Total population of the area (annual growth rate may be added to the 1981 census)
- \* birth rate (B.R.)
- \* infant mortality rate (I.M.R.)
- \* age specific death rates

$$4.1 \text{ No. of pregnant women} = \text{Total population} \times \text{B.R. (as decimal)}$$

$$4.2 \text{ No. of children at one year} = \text{Population} \times \text{B.R.} \times (1 - \text{I.M.R.})$$

(B.R. & I.M.R. as decimals)

$$4.3 \text{ No. of children at 5 years} = \text{Population} \times \text{B.R.} \times (1 - \text{I.M.R.}) \times (1 - \text{age spec. death rates})$$

OR (roughly)

$$\text{No. of children at 5 years} = \text{Infants} \times 0.984$$

$$\text{No. of children at 10 years} = \text{No. of children at 5 years} \times 0.966$$

$$\text{No. of children at 16 years} = \text{No. of children at 10 years} \times 0.954$$

(death rates being taken as 4/1000 in children 1-9 years and 2.5/1000 in children 10-16 years)



#### 4.4 Example

|            |                      |
|------------|----------------------|
| Population | 100000               |
| B.R.       | 35/1000 population   |
| I.M.R.     | 125/1000 live births |

Age specific death rates not known

- \* No. of pregnant women =  $100000 \times 0.035 = 3500$
- \* No. of infants =  $100000 \times 0.035 \times (1-0.125)$   
=  $100000 \times 0.035 \times .875 = 3063$
- \* No. of children under two years will be approximately double or 6126
- \* No. of children at 5 years =  $3063 \times .984 = 3014$
- \* No. of children at 10 years =  $3014 \times .966 = 2912$
- \* No. of children at 16 years =  $2912 \times .954 = 2778$

#### 5. Vaccines

**5.1** Vaccines are made from the same or antigenically very similar micro-organisms which cause the diseases but these are made weak or killed so that they are unable to produce the illness. Vaccines may be of three types—live, killed and toxoid (detoxified toxins). Vaccines are characterised by the following :

- while losing the ability to produce disease, vaccines retain their antigenic properties so that the body responds to them as it would during natural infection. The immunity, thus produced protects the individual from further attacks of the disease;
- are specific in their action and will protect only against the disease for which they are made. Thus polio vaccine will protect against poliomyelitis and tetanus toxoid against tetanus and not vice versa;
- one dose of some vaccines is adequate for protection, others require two or more doses spaced at intervals of one to two months. Booster doses are sometimes required to keep up the level of immunity;
- have a limited shelf life and are heat labile; and
- potency once lost cannot be regained.

#### 5.2 Production

The Central Research Institute, Kasauli (H.P.), the Haffkine Bio-Pharmaceutical Corporation Limited, Bombay, BCG Vaccine Laboratory, Guindy and the Pasteur Institute, Conoor, meet the demands of the country for the vaccines. Only polio vaccine is

imported in bulk and diluted and bottled at Bombay. Supplies of DPT vaccine are partly met from the private sector. Indigenous production of oral polio vaccine is expected to commence from 1984.

### 5.3 Vaccine efficacy

Vaccines are effective only if the full course of a potent vaccine is given at the right age.

The efficacy of pertussis and BCG vaccines is said to be around 80% and of diphtheria, tetanus and polio vaccines - 95%. The efficacy of vaccines is calculated as follows :\*

$$\text{Vaccine efficacy} = \frac{\text{Attack rate in unvaccinated} - \text{attack rate in the vaccinated}}{\text{Attack rate in unvaccinated}} \times 100$$

### 5.4 Programme effectiveness

Programme effectiveness of an immunization programme is estimated in the following manner :

$$\text{Programme effectiveness} = \frac{\text{Coverage of the eligible population} \times \text{vaccine efficacy}}{\text{Coverage of the eligible population}}$$

## 6. Requirements for vaccines

6.1 Requirement of a particular vaccine is calculated as follows :

- Total no. of children proposed to be vaccinated (target)
- x
- No. of doses to be given
- +
- 10% wastage factor
- ÷
- Periodicity of supply

### For example

Total no. of children below two years in the area = 6126  
 No. of children already immunized during the previous year = 1126  
 No. of eligibles = 5000

\* Weekly Epidemiological Record, 1981, 7 : 53-55



Proposed coverage = 85% or 4250

No. of doses of DPT vaccine to be given = 3

Periodicity of supply (monthly)

$(4250 \times 3) + 10\% \div 12 = 1169$  doses

Since the vaccine is supplied in 10 dose vials 117 vials need to be ordered. For vaccines which are supplied in 20 dose vials (polio vaccine) 59 vials need to be ordered. Check BALANCE STOCK before placing an indent for more vaccines.

**6.2** In case campaigns are proposed in winter then more vaccines will be required during this period and the requirements for the vaccines will not be evenly distributed over the 12 months. It is, therefore, important that strategies of vaccination services should be planned well in advance and the requirements of vaccines chalked out month-wise.

**6.3** Indent for the vaccines should be placed by the M.O. of the PHC with the concerned district health officer, who will forward the requirements of the district to the state EPI Officer. Indents for the vaccines should not be placed directly with vaccine manufacturing institutes.

**6.4** At any given time a PHC should not keep more than one month's requirements. Vaccines should not be kept at sub-centres unless there are reliable means of storage. The state and districts stores can stock 3 months' supplies + 10% buffer stock provided adequate cold storage facilities are available.

**6.5** Vaccine supplies to the districts should be adjusted by the state/regional stores from within the allocated quantities. State allocation is increased if the state vaccination target is proportionately increased.

## **6.6 Supply**

The vaccines are supplied quarterly except polio vaccine which is supplied monthly. The vaccines are despatched by air unless road transport is quicker and more convenient. Prior intimation is given so that the vaccines can be cleared immediately on arrival at the airport.

## **6.7 Storage**

- i) All vaccines must be stored and transported at +4 to +8°C. Polio vaccine can be kept at sub zero temperatures.
- ii) Do not freeze DPT, DT, TT and typhoid vaccines.
- iii) Check expiry dates. Normally vaccines received earlier must be used first.

## **6.8 Distribution** (See Fig. 1, page 11)

- i) Supplies to the districts should be made on the basis of their actual requirements after checking the balance stocks.
- ii) The vaccines should be despatched with a courier and should not be sent unaccompanied by rail or road.
- iii) Do not expose to direct sunlight during transportation.

### **REMEMBER**

- \* Store and transport vaccines at +4 to 8°C
- \* Do not expose to direct sunlight.
- \* Do not keep in the door of the refrigerator
- \* Do not freeze DPT, DT, TT and Typhoid vaccines
- \* Monitor utilization reports
- \* Check balance stocks
- \* Do not use date expired vaccine

## **7. Maintenance and use of cold chain equipment**

The cold chain is a system of transporting and storing vaccines at recommended temperatures from the manufacturer to the point of use. The cold chain comprises of three components—the cold chain equipment, transport and manpower. Without adequately trained and motivated personnel, it is difficult to sustain the cold chain even where adequate facilities are available.

Once the potency of a vaccine has been lost, it cannot be regained by putting it back in the refrigerator. The vaccines must be stored and transported at temperatures between +4 to +8°C; polio vaccine can be kept at sub zero temperatures. DPT, DT, TT and Typhoid vaccines should not be frozen. The vaccines should not be exposed to direct sunlight.

Since the vaccines have a limited shelf life and lose their efficacy easily if not handled properly, only the amounts actually required should be ordered. Large balance stocks should not be allowed to accumulate. Transport and storage arrangements should be checked before placing an indent for vaccines. One person should be made responsible for the indenting, receiving, storing and distributing vaccines. The flowchart on page 15 gives some of the steps for the development of an effective cold chain for vaccines (Fig. II, page 13).



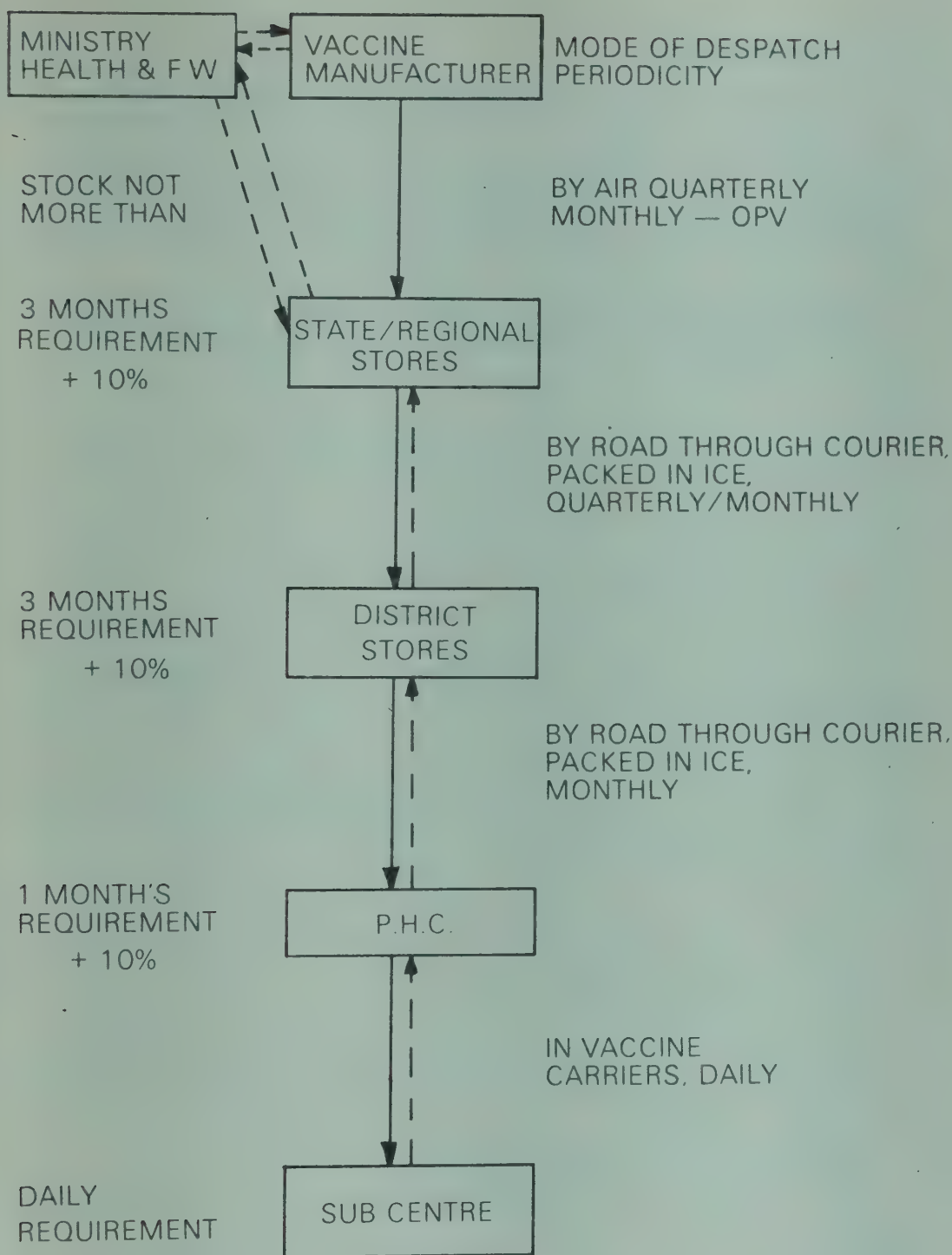


FIG. I — DISTRIBUTION OF VACCINES

## **7.1 Refrigerators**

The equipment most widely used for the storage of vaccines are refrigerators. These should be handled carefully so that the temperature in the cabinet does not rise above +8°C. If the refrigerator is opened frequently, it will not be able to maintain the required temperature. Many refrigerators get out of order soon after installation only because of poor maintenance.

The checklist given below will help to prolong the working life of the refrigerator and ensure the proper storage of the vaccines :

### **DOs**

- \* keep the refrigerator in a cool room away from direct sunlight and at least 10 cms away from the wall
- \* keep the refrigerator absolutely level
- \* fix the plug permanently to the socket
- \* use voltage stabilizer
- \* keep the vaccines neatly with space between the stacks for circulation of air
- \* keep ice or ice-packs in the freezer and water bottles in the shelves not utilized for the storage of vaccines to keep the temperature down for a longer period in case of power failure.
- \* The cold water should not be used for drinking.
- \* block the inside of the door of the refrigerator so that it is not used for the storage of vaccines.
- \* keep the refrigerator locked and open it only when absolutely necessary
- \* check the temperature twice a day and maintain a record which should be supervised regularly
- \* defrost periodically
- \* tape a sheet of paper to the outside of the refrigerator which tells anyone finding the refrigerator not working :
  - whom to contact
  - where to check for a blown fuse
  - alternate place for vaccine storage

### **DON'Ts**

- \* don't keep vaccines in the door of the refrigerator
- \* don't keep food or drink in the refrigerator
- \* don't open the door unless absolutely necessary



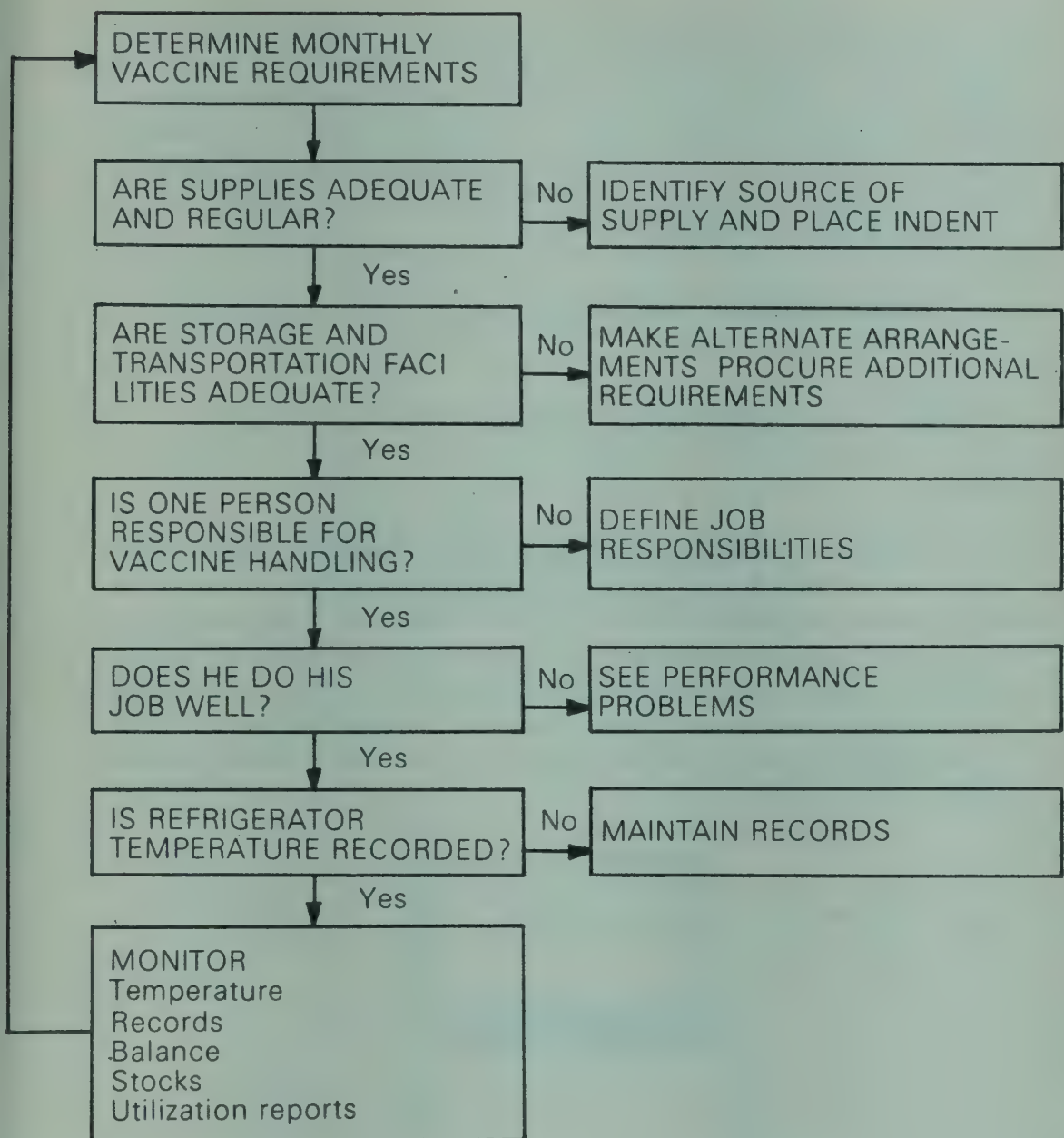


FIG. II — SCHEME FOR INVESTIGATIONS OF PROBLEMS IN RELATION TO THE COLD CHAIN FOR VACCINES AT IMMUNIZATION CENTRES

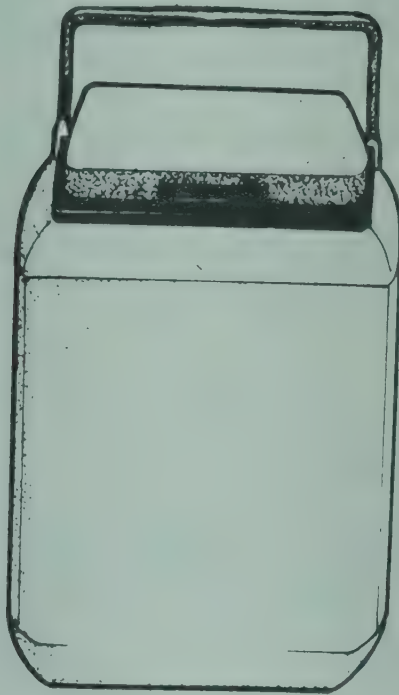
**7.2 Cold rooms** are used for the storage of large quantities of vaccines. There should be an assured source of constant electric supply and regular monitoring of the temperature. Cold rooms should have free access 24 hours a day and 7 days a week, so that in case of any breakdown or power failures the defect could either be rectified or the vaccines transferred to an alternate place for storage.

**7.3 Deep freezers** have been supplied for :

- \* preparation of ice packs
- \* preparation of ice
- \* storage of polio vaccine

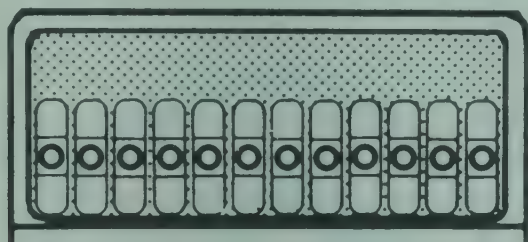
DPT, DT, T T and Typhoid vaccines should not be kept in deep freezers.

**7.4 Vaccine carriers** are used for carrying small quantities of vaccines to the subcentres or villages by the health workers. The vaccine carriers are made of insulation material, the quality and thickness of which determine the cold life of the carriers. The ice packs for lining the sides of the carriers should be fully frozen and the lid of the carrier should shut tightly. The vials of DPT, DT, T T and Typhoid vaccines should not be in direct contact with the frozen ice packs.





**7.5 Cold packs** (ice packs) are used for lining the walls of cold boxes and vaccine carriers to keep them cold. They are flat plastic bottles filled with water. The ice packs are prepared by keeping them in the freezer or in the freezer compartment of an ordinary refrigerator. The time taken to freeze an ice pack in the freezing compartment is reduced if the ice packs stand with their edges in contact with the evaporator and not flat on one another. Salt should not be added to the water as it lowers the temperature to sub zero temperatures which is not recommended for DPT, DT, TT and Typhoid vaccines.

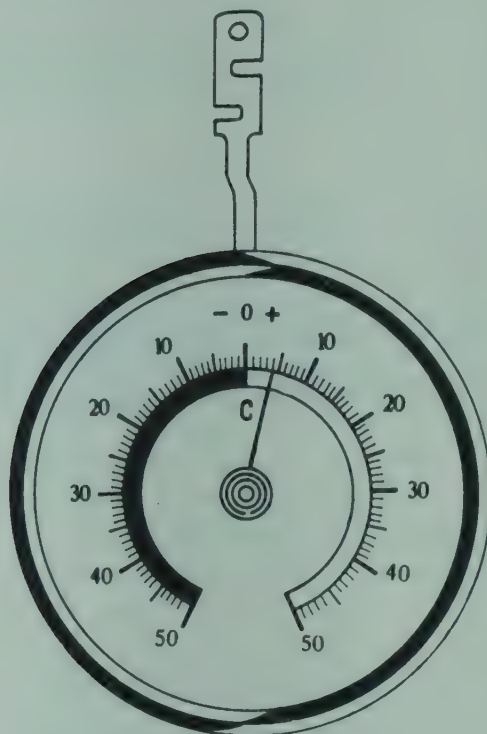


**7.6 Thermocole boxes** are available in the country in a variety of shapes and sizes. They are lighter and cheaper than vaccine carriers but are not as durable and have a much shorter cold life. Since ice packs are not available with the thermocole boxes, ice is used for cooling. This is packed in a polythene bag and placed on TOP of the vaccine vials, but not in direct contact.

If more than one vaccine carrier or thermocole box is being carried, keep the whole range of the vaccines required for the day's use in each carrier so that only one carrier is opened at a time.



**7.7 Dial thermometers** are used to record the temperature in the refrigerators. The thermometer is kept in the top shelf of the refrigerator. One person should be made responsible to record the temperature twice a day. The temperature record should be checked during supervisory visits.



At the end of each month the number of times the temperature exceeded  $+8^{\circ}\text{C}$  should be recorded. (Form 1, Page 21).

| Duration (hours) | 1-2 | 3-5 | > 5 |
|------------------|-----|-----|-----|
| Frequency        |     |     |     |

**REMEMBER**

- \* Do not leave vaccine carriers in direct sunlight.
- \* Do not leave the lid open.
- \* Keep the vaccine carrier clean and dry.
- \* Check for any cracks or holes.
- \* Use frozen ice packs.



# REFRIGERATOR TEMPERATURE RECORD FORM

(Keep in a folder on top of refrigerator for inspection by supervisor)

STATE \_\_\_\_\_ DISTRICT \_\_\_\_\_

TOWN/PHC \_\_\_\_\_ WARD/BLOCK \_\_\_\_\_

NAME OF CENTRE \_\_\_\_\_

MONTH \_\_\_\_\_

Please answer : Yes/No  
(on last day of the month)

- A. Is the refrigerator
1. Level ?
  2. away from sunlight ?
  3. locked ?
  4. defrosted periodically ?
  5. plugged to socket permanently ?
  6. not used for food or drink ?

- B. Are the vaccines
1. stacked neatly ?
  2. rotated ?
  3. not kept in the door ?
  4. not frozen ? (except polio)
  5. not date expired ?

- C. No of ice packs prepared during the month

D.

| Temperature > 8°C |     |     |    |
|-------------------|-----|-----|----|
| Duration (hours)  | 1—2 | 3—4 | 5+ |
| Frequency         |     |     |    |

| Date | Temperature (°C) in refrigerator |      | Power failure (duration in hours) |
|------|----------------------------------|------|-----------------------------------|
|      | 10 am                            | 4 pm |                                   |
| 1    |                                  |      |                                   |
| 2    |                                  |      |                                   |
| 3    |                                  |      |                                   |
| 4    |                                  |      |                                   |
| 5    |                                  |      |                                   |
| 6    |                                  |      |                                   |
| 7    |                                  |      |                                   |
| 8    |                                  |      |                                   |
| 9    |                                  |      |                                   |
| 10   |                                  |      |                                   |
| 11   |                                  |      |                                   |
| 12   |                                  |      |                                   |
| 13   |                                  |      |                                   |
| 14   |                                  |      |                                   |
| 15   |                                  |      |                                   |
| 16   |                                  |      |                                   |
| 17   |                                  |      |                                   |
| 18   |                                  |      |                                   |
| 19   |                                  |      |                                   |
| 20   |                                  |      |                                   |
| 21   |                                  |      |                                   |
| 22   |                                  |      |                                   |
| 23   |                                  |      |                                   |
| 24   |                                  |      |                                   |
| 25   |                                  |      |                                   |
| 26   |                                  |      |                                   |
| 27   |                                  |      |                                   |
| 28   |                                  |      |                                   |
| 29   |                                  |      |                                   |
| 30   |                                  |      |                                   |
| 31   |                                  |      |                                   |

## 8. The EPI Diseases

The diseases preventable by immunization usually strike the children early during infancy or the pre-school period. For example, majority of the children get infected with polio viruses before two years of age, poliomyelitis being quite rare in children above 5 years in India. Complications following whooping cough are known to be more severe in infants and young children. Diphtheria, tetanus, tuberculosis and typhoid fever are also reported in school going children.

It is important that all the cases of the vaccine preventable diseases are recognized in time and reported to the local health authorities so that treatment could be started in time and preventive measures taken to check the further spread of the diseases.

Many of the signs and symptoms are common with other infectious diseases of childhood. However, by a process of systematic elimination these diseases can be diagnosed reasonably well. Laboratory confirmation is required in some cases. It is interesting to note that most of the target diseases manifest as fits, fever or cough.

**8.1 Fits** may be one of the major presenting symptoms in the neonatal period. These are generally due to birth injury, hypoglycemia, meningitis and neonatal tetanus (NNT).

Fits as a result of birth injuries are evident within the first few days: The child is unwell since birth, has difficulties in sucking and the fits are usually confined to one side of the body. Fits during this period affecting whole of the body may result from hypoglycemia.

Convulsions in the second or third week of life may be due to meningitis or tetanus. Bulging anterior fontanelle with fever should lead one to suspect meningitis. Fits in neonatal tetanus are worsened by noise or movements. Due to tightening of muscles around the mouth in NNT, the child is unable to suck.

The process of diagnosis of a case presenting as fits during the neonatal period is shown in Fig. III, page 19.

**8.1.1 Neonatal tetanus :** Tetanus is one of the major causes of neonatal mortality in the country. The problem of tetanus is compounded by the fact that not only is **Clostridium tetani** widespread, but also that tetanus spores are highly resistant and

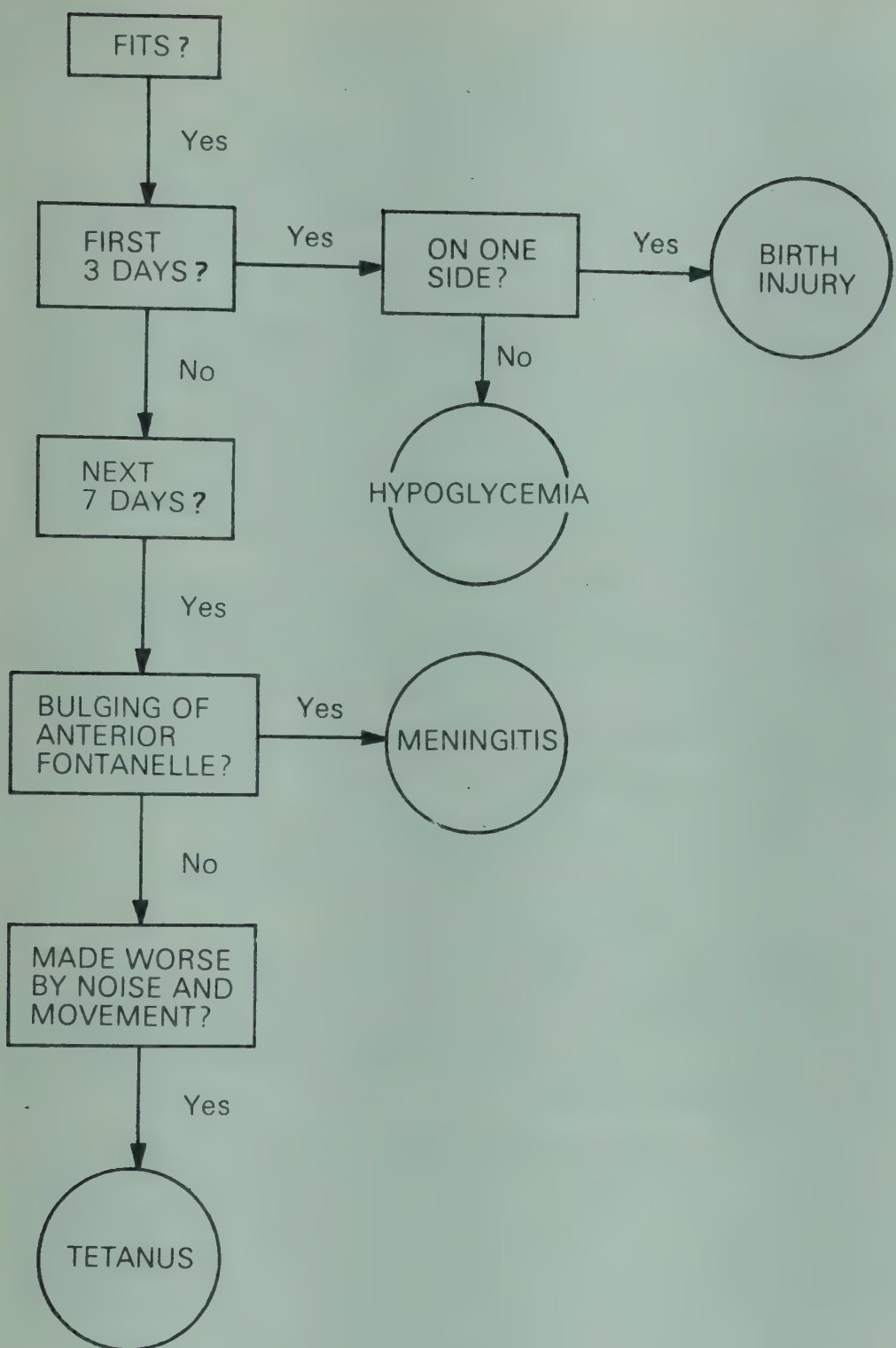


FIG. III — FITS IN THE NEONATE PERIOD



can survive for long period in the soil. The risk of exposure of the newborn to the spores, specially in the rural areas is extremely high since the surrounding environment is heavily contaminated with these spores. The symptoms of the disease appear 3 to 14 days after birth and death rapidly follows often before the child can be taken to a health centre for treatment. Even in the hospitals, the case fatality rate continues to be high with the death of nearly three out of every 4 cases admitted.

The disease is, however, preventable. The control measures are directed towards taking adequate precautions to avoid infection at the time of cutting the cord or by placing unclean dressings on the umbilical stump. The immunization of women during pregnancy provides protection to the infant for the first few months of life. Two doses of tetanus toxoid are required to be given, the second at least two weeks before birth.

Coverage of the women with tetanus toxoid can lead to a virtual elimination of the disease in the newborns (Fig. IV, page 21). The vaccination however, provides individual protection and the services must be continued even in the absence of clinical disease in the area.

### **Methods of prevention**

1. Immunization of pregnant women  
—give two doses of TT. Interval between doses should not be less than one month.
2. Hygienic care at birth  
—use a sterile blade for cutting cord
3. Post natal care  
—do not put unclean dressings on the umbilical stump.

### **8.1.2 Tetanus in others**

Tetanus can also occur in older children and adults. The spores enter the body when broken skin (cuts, wounds, burns) is contaminated with soil, dust or other substances containing tetanus spores. Unsterilized instruments used for extracting teeth, or cleaning ears can also transmit the spores. Otogenic infections have been found to be a predisposing factor in tetanus in young children. The patient complains of painful spasms and twitching of the jaw muscles. The body is characteristically bent like a bow due to the contractions of the muscles of the neck and the trunk. The case fatality rate is high.

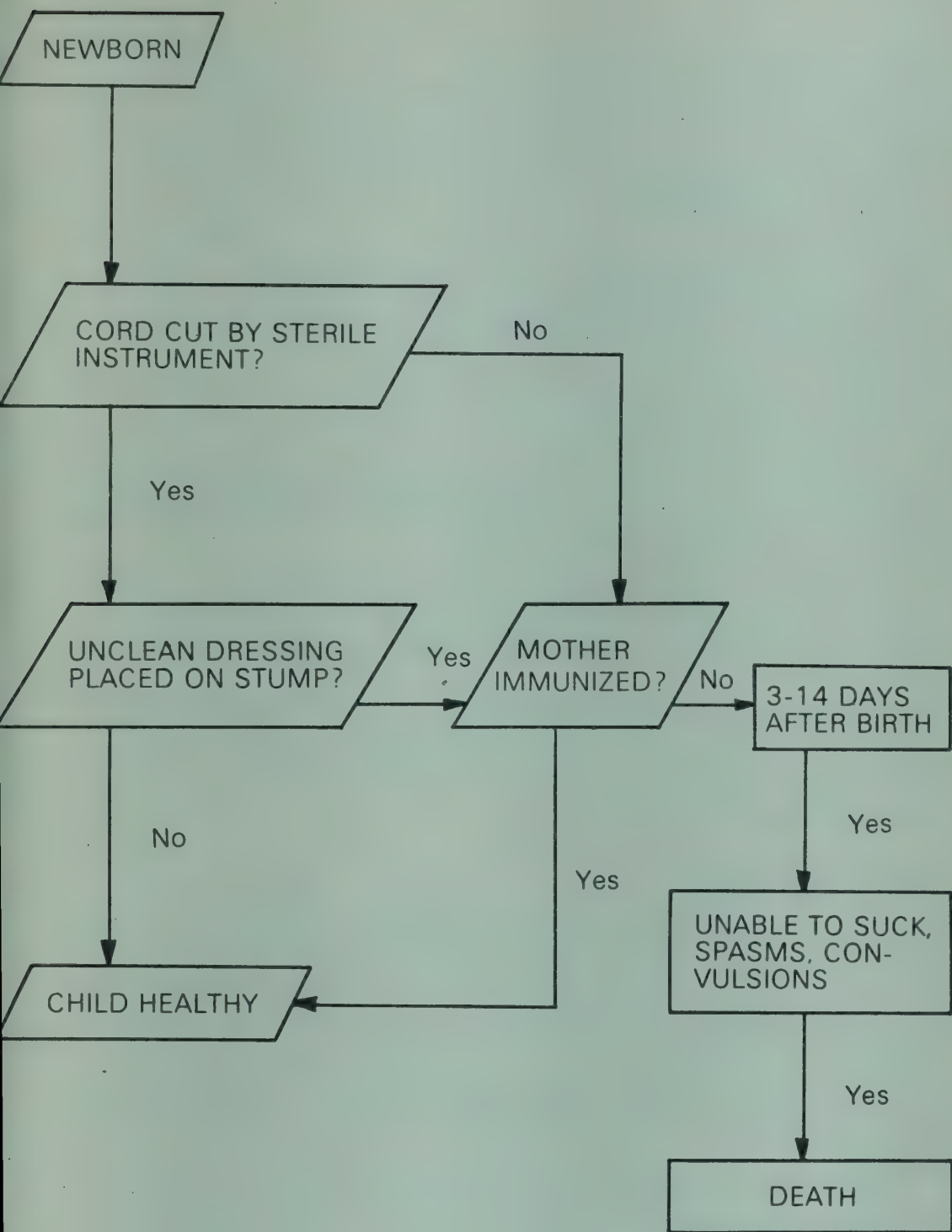


FIG. IV — TETANUS IN THE NEWBORN

01911  
CH131

COMMUNITY HEALTH CELL  
326. V Main, 1 Block

## 8.2 Fever

Fever and cough are the other common presenting symptoms of the diseases preventable by immunization.

When a child comes with fever, the questions to be asked are about the presence of :

- sore throat ?
- membrane in the throat ?
- nasal catarrh and watering of eyes ?
- distribution and day of appearance of the rash ?
- pain and weakness in the limbs ?

Fever with sore throat and presence of a membrane is strongly suspicious of diphtheria.

Fever with catarrh and watering of the eyes followed by rash on the third or fourth day starting from the face and spreading downwards may be due to measles.

Fever accompanied by pain in one leg or arm may be due to poliomyelitis in which event weakness in the affected limb followed by paralysis, will be seen a few days later (Fig. V, page 23).

Tuberculosis should be suspected in case of low grade fever for a number of days. In tuberculous meningitis there may be high fever, severe headache, and stiffness of the neck and convulsions.

### 8.2.1 Diphtheria

When a child comes with fever and also complains of a sore throat, the throat should be checked to see if there is a membrane. Within four to six days after the symptoms appear, the child can be very ill with a markedly swollen throat and a greyish membrane with well defined-edges in the throat if the child has diphtheria. The child has difficulty in breathing. The toxins liberated by the bacteria can also affect the heart muscles and the nerves.

Diphtheria is caused by *Corynebacterium diphtheriae*. The disease affects tonsils, pharynx, larynx, nose and skin. The source of infection are patients as well as healthy carriers. The bacteria are excreted from the last day of the incubation period throughout the course of the disease.

The bacteria spread from one person to another in small droplets through the air. They can also spread by direct contact



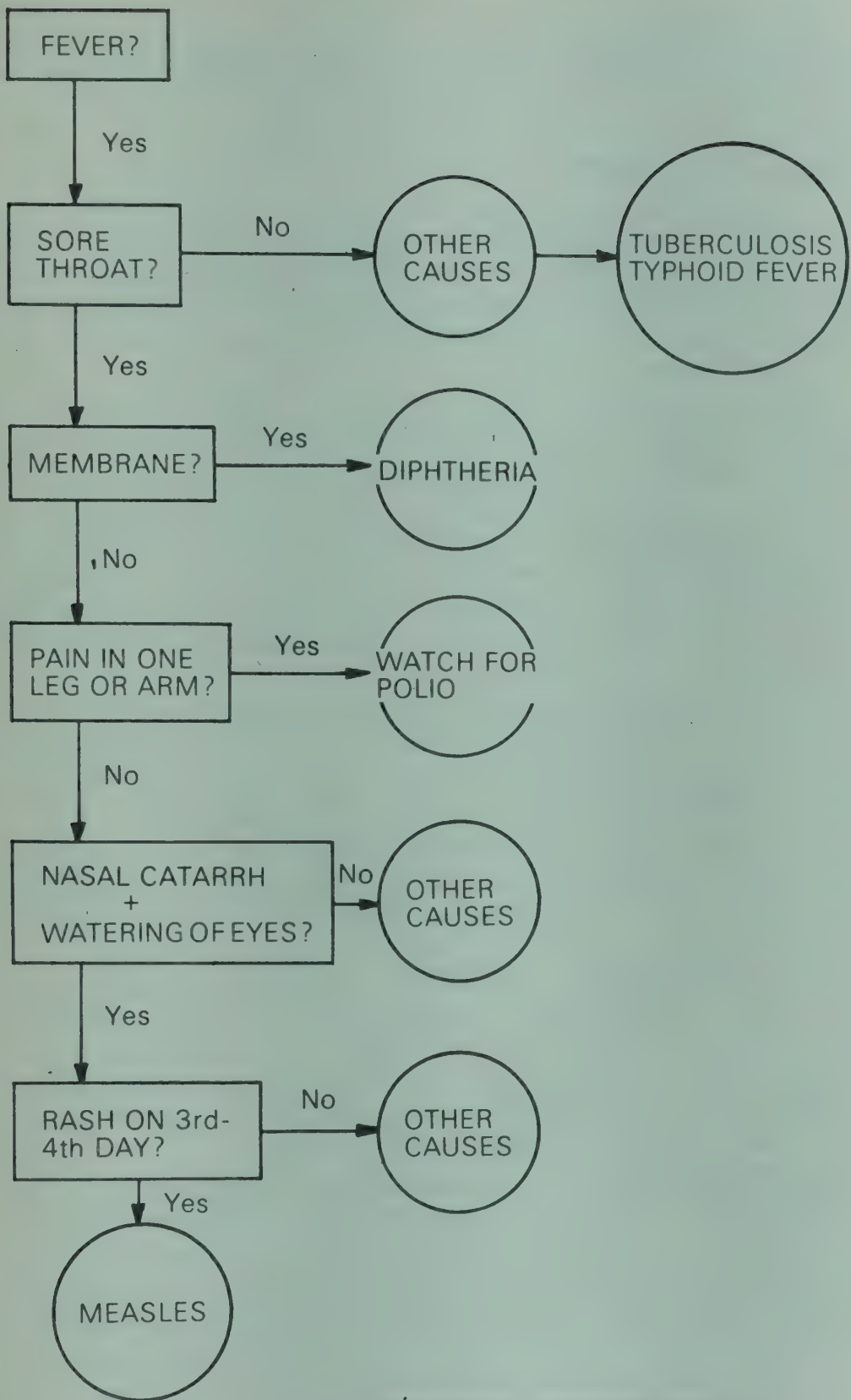


FIG. V — FEVER IN YOUNG CHILDREN

or indirectly through objects, such as toys, clothes, crockery etc., freshly contaminated with the throat and nose secretions of the patient.

### 8.2.2 Poliomyelitis

Young children with fever should be examined for pain or weakness of the muscles in the legs or arms. Paralysis of one or more limbs may follow if it is poliomyelitis. The paralysis does not progress further once the acute phase of the disease is over. Paralysis is of the flaccid type; pain and tactile sensations of the affected limb are normal.

Symptoms usually appear 5 to 14 days after infection. The severity of the disease ranges from inapparent infection to non-paralytic and paralytic disease. The patient complains of fever, headache, gastrointestinal disturbances, weakness and stiffness of the neck and back. There may also be paralysis. Paralysis is characteristically asymmetrical and usually of the lower extremities. Paralysis of the muscles of respiration and swallowing may lead to death and paralysis of the limbs can disable the child for life.

Poliomyelitis is caused by polio viruses types I, II and III. The source of infection are patients and more frequently children with inapparent form of infection. The cases are most infectious 7 to 10 days before and after the onset of symptoms.

The viruses are excreted with faeces and spread through contaminated food, water and articles of daily use. The viruses can also spread through the air in the form of small droplets.

**8.2.3. Tuberculosis** should be suspected in case of low grade fever for a number of days. The child is listless and there may be loss of weight. Tuberculosis can affect any part of the body. In tuberculous meningitis there may be high fever, severe headache, stiffness of the neck and convulsions. Tuberculosis of the glands may lead to suppuration and open wounds.

The disease is caused by **Mycobacterium tuberculosis**. The most common source of infection are tuberculous patients. Untreated or inadequately treated patients may periodically discharge the bacilli in their sputum for years. Tuberculosis of organs other than the lungs without a discharge is not directly communicable. Antimicrobial therapy generally reduces communicability within a few weeks.

**8.2.4. Typhoid fever** may give rise to prolonged fever. Approximately two weeks after infection, the patient complains of continuous fever, headache, weakness, loss of appetite, irritability, sleeplessness and constipation. The lips are cracked and the tongue is coated a dirty brown. The liver and spleen are enlarged.

Typhoid fever is caused by **Salmonella typhi** and paratyphoid fever by **S. Paratyphi A**. Paratyphoid fever B is rare in India. The bacteria spread through food and water contaminated with the faeces or urine of patients and healthy carriers.

### **8.2.5. Measles**

Fever with catarrh and watering of the eyes followed by rash on the third or fourth day starting from the face and spreading downwards may be due to measles.

The symptoms appear about 9 to 10 days after close contact with a patient. There is fever, conjunctivitis, running nose, bronchitis and small white spots (Koplik's spots) on the inner surface of the cheeks. A characteristic dusky red blotchy rash appears on the third or fourth day. The rash first appears on the face and gradually spreads over the whole body. The rash lasts for four to six days. An attack of measles may lead to secondary infections of the lungs, ears, eyes and gastrointestinal tract. The complications can be severe, specially in malnourished children.

Measles is caused by measles virus. The source of infection are patients who may excrete the virus a few days before and about 2 weeks after the appearance of rash. The virus spreads through the air in small droplets. There is no transmission via articles or clothing or through an intermediary due to the low stability of the virus.

### **8.3. Cough**

In young children cough may be due to a variety of causes such as upper respiratory tract infections, acute tonsillitis, bronchitis, pneumonia, asthma and whooping cough. Investigations for tuberculosis should be carried out in cases with cough presenting for more than 4 weeks.

In whooping cough the coughing episodes gradually get longer and more severe making it difficult for the child to breathe. The child often vomits after coughing the breath is accompanied by a "whooping" sound inspiration (Fig. VI, page 27).



### 8.3.1. Whooping Cough (Pertussis)

The symptoms appear 5 to 8 days after contact with a patient. The disease develops slowly with slight fever, cold and irritating cough which gradually becomes paroxysmal, usually within one to two weeks, and lasts for one to two months. Paroxysms are characterised by repeated violent cough. During coughing fits there is difficulty in the inhalation of breath. The coughing fits are followed by a highpitched inspiratory whoop and frequently there is an expulsion of clear thick mucus. The eyes may bulge during coughing spasms and there may be bleeding in the eyes or eyelids. The child vomits after severe bouts of coughing. Young infants may not have typical paroxysms. Whooping cough can lead to malnutrition and secondary infections specially pneumonia.

Whooping cough is caused by **Bordetella pertussis**. The source of infection is a sick child. The child is very infectious during the early stages of the disease before the typical symptoms of cough have appeared.

The bacilli spread in small droplets through the air. They can also spread by indirect contact with articles freshly soiled with respiratory discharge of infected persons.

## 9. Surveillance

Surveillance of diseases is an important component of preventive health care services. The programmes can be planned more effectively if there is a regular and reliable flow of information on those who are becoming sick. The information is also essential for monitoring so that deficiencies could be pinpointed in time and necessary corrective action taken (Fig. VII, Page 31). The impact of the services can be documented only if there is an efficient surveillance system.

While the need for reliable information is clearly understood, the collection, compilation and analysis of such data pose enormous problems in a large country as India with diverse geographic and socio-economic characteristics and limited health infrastructure. Different methods are, therefore, employed in different areas depending on technical and administrative feasibility as well as financial resources.

Surveillance signifies a collection of data for some action. It is necessary not only to know the number of cases occurring in the area, but also the age at which they occur, severity of the disease and the vaccination status.

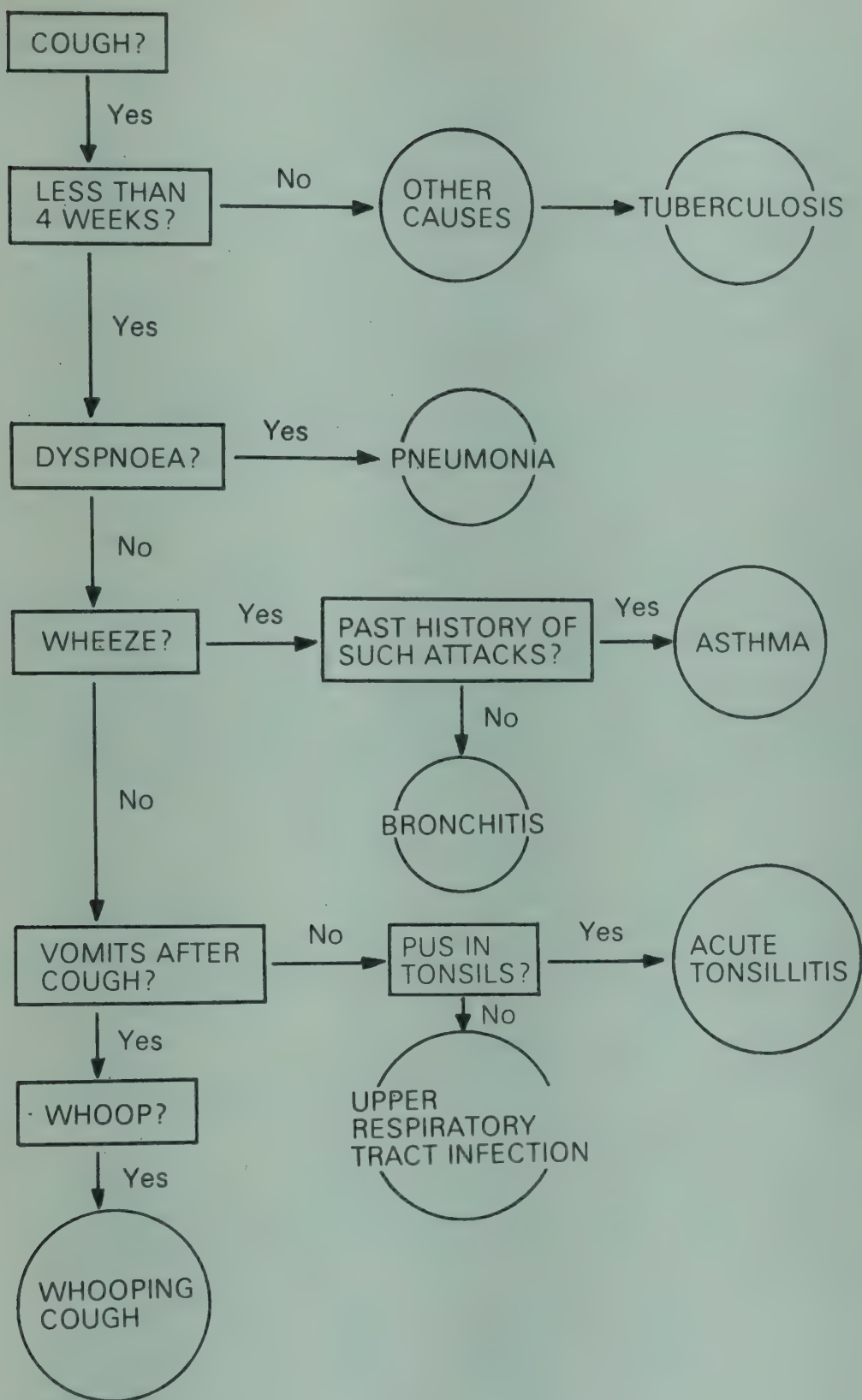


FIG. VI — COUGH IN YOUNG CHILDREN

## THE EPI TARGET DISEASES

| Disease          | Causative agent             | Mode of transmission | Incubation period | Major sign and symptoms  | Complications                             | Specific treatment | Immunity      |
|------------------|-----------------------------|----------------------|-------------------|--|---|--------------------|---------------|
| 1                | 2                           | 3                    | 4                 | 5  | 6   | 7                  | 8             |
| Neonatal tetanus | Clostridium tetani          | Broken skin          | 3-14 days         | * A week later inability to suck and fits worsened by noise or movement<br>sucks well at birth                       | —   | Available          | No            |
| Tetanus          | -do-                        | -do-                 | 10-15 days        | * lock jaw-unable to open mouth fully<br>* painful contractions of muscles or neck and trunk bending body like a bow | —   | -do-               | No            |
| Diphtheria       | Corynebacterium diphtheriae | Air                  | 2-10 days         | * fever<br>* swollen neck<br>* membrane in throat<br>* difficulty in breathing                                       | Toxins can affect heart muscle and nerves | -do-               | Yes           |
| Poliomyelitis    | Polio viruses I, II and III | Food, water, air     | 5-14 days         | * weakness in the arms or legs<br>* paralysis flaccid<br>* pain and tactile sensations normal                        | Residual paralysis                        | Not available      | Type specific |



| 1                 | 2   | 3                 | 4         | 5  | 6   | 7                | 8         |
|-------------------|---|-------------------|-----------|--|---|------------------|-----------|
| Tuber-<br>culosis | Mycobac-<br>terium<br>tuberculosis                | Air               | Not known | <ul style="list-style-type: none"> <li>* fever</li> <li>* listlessness</li> <li>* loss of weight</li> <li>* loss of appetite</li> <li>* coughing</li> <li>* severe headaches, stiffness of neck and convulsions (Tuberculosis meningitis)</li> </ul> | —   | Available        | Not known |
| Typhoid<br>fever  | Salmonella<br>typhi<br>Salmonella<br>paratyphi A. | Food and<br>water | 2 weeks   | <ul style="list-style-type: none"> <li>* prolonged fever</li> <li>* headache</li> <li>* loss of appetite</li> <li>* sleeplessness</li> </ul>   | —   | Available        | Yes       |
| Measles           | Measles<br>virus                                  | Air               | 9-10 days | <ul style="list-style-type: none"> <li>* fever</li> <li>* catarrh</li> <li>* conjunctivitis</li> <li>* rash on 3-4th day</li> </ul>  | Malnutri-<br>tion, sec-<br>ondary<br>infec-<br>tions                  | Not<br>available | Yes       |
| Whooping<br>cough | Bordetella<br>pertussis                           | Air               | 5-8 days  | <ul style="list-style-type: none"> <li>* fever, cough, cold</li> <li>* coughing paroxysms during 2nd week</li> <li>* bulging eyes, bleeding in eyes during cough spasms</li> <li>* vomiting after cough spasms</li> </ul>                            | Malnutri-<br>tion, sec-<br>ondary<br>infec-<br>tions, brain<br>damage | Available        | Yes       |

There are many ways of collecting the relevant information. Each of the methods has its advantages and limitations and can be used either separately or in combination with each other.

### **9.1. Methods for collection of data**

**A. Routine reporting:** Routine reporting of cases and deaths is the simplest and the most widely practised way of collecting information. The major disadvantage of the system is the difficulty in defining the quality or regularity of the reports. The criteria of diagnosis may vary since a large number of health centres are involved. Moreover, those with mild or moderately severe forms of the disease who do not seek treatment or go to private practitioners, are not recorded under the system.

The district health officer should try to identify all the centres to which cases of EPI diseases report for treatment and attempt to get regular reports from these places. A list of reporting units should be available at the district and state office for follow up action. Teaching hospitals and voluntary institutions should also be included in the list.

**B. Sentinel centres:** A sentinel information system can be developed to obtain more reliable and extensive disease incidence data than would be available through the routine information system. A hospital, health centre, laboratory, rehabilitation centre which attend to a large number of cases of a particular diseases can be considered as sentinel centres for that disease. The quality of information would be dependable and the regularity of the reports maintained. The additional data available would help identify specific population groups at risk and facilitate monitoring of the services provided. Generally information on age, residence and immunization status is included in the forms for sentinel centres. It is important that there is a close liason between the sentinel centres and the local health office so that immediate action could be taken on the reports when necessary (Form II & III, pages 32 through 34).

The data collected by the sentinel centres can be effectively used both for the immediate implementation in the field as well as for future plans and policy decisions. The sentinel centres can serve as indicators of the impact of the services provided. At the same time, they can be efficient "watch-dogs" of the quality of the services, for example whether the children are getting the diseases after completing the recommended course of the

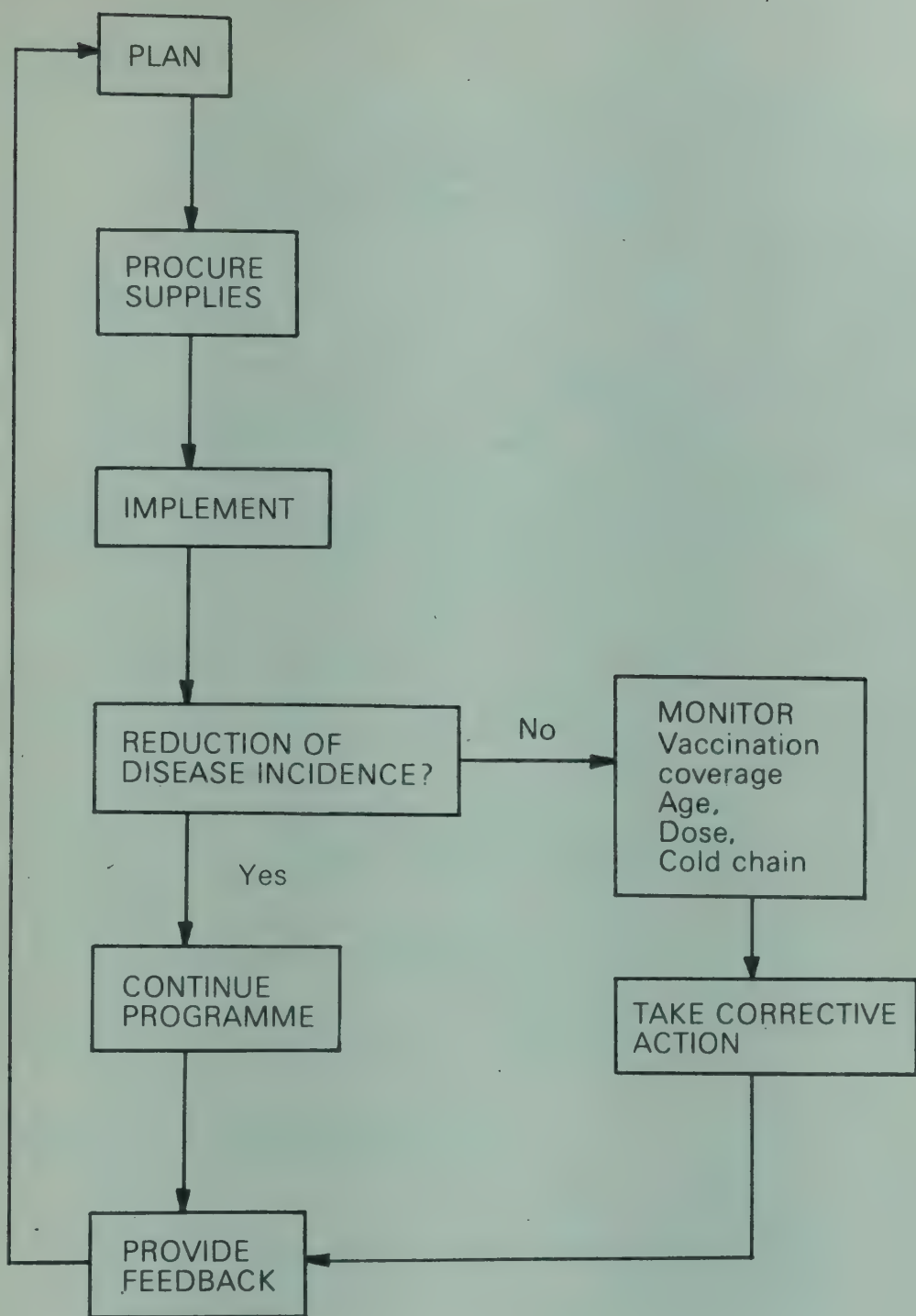


FIG. VII—THE IMMUNIZATION PROGRAMME



# SURVEILLANCE OF POLIOMYELITIS

## SENTINEL CENTRES

(Acute cases of poliomyelitis only)

MONTH \_\_\_\_\_

1. State \_\_\_\_\_ 2. District \_\_\_\_\_
3. Town \_\_\_\_\_
4. Hospital \_\_\_\_\_
5. Total admission to hospital during the month \_\_\_\_\_

A. POLIOMYELITIS\* (children who are permanent residents of the district)\*\*

| Age      | No. of cases |     |       | Vaccination status prior to illness |         |           |           |
|----------|--------------|-----|-------|-------------------------------------|---------|-----------|-----------|
|          | IPD          | OPD | Total | 1 dose                              | 2 doses | 3 doses # | booster # |
| 0.6 mo   |              |     |       |                                     |         |           |           |
| 7-11 mo  |              |     |       |                                     |         |           |           |
| 12-23 mo |              |     |       |                                     |         |           |           |
| 24-35 mo |              |     |       |                                     |         |           |           |
| 36-47 mo |              |     |       |                                     |         |           |           |
| 48-59 mo |              |     |       |                                     |         |           |           |
| 60 + mo  |              |     |       |                                     |         |           |           |
| Total    |              |     |       |                                     |         |           |           |

B. POLIOMYELITIS\* (children who are not residents of the district)

No. of cases      With history of 3 doses

Name and designation of medical officer

Date

Please mail the form to:

1. The ADG (EPI), Ministry of Health and Family Welfare, Nirman Bhawan, New Delhi 110 011
2. The State EPI Officer
3. The District Health Officer

- Note : \*
- Please do not record cases who developed the disease prior to April 198
- \*\* Residents are considered those children who have lived in the district for 6 months or more
- # Please give details on reverse page

## DETAILS OF CHILDREN WITH HISTORY OF 3 DOSES OF OPV

| Sl. No. | Name of child | Name of parent | Address | Age | Sex | Date of onset of paralysis | Vaccination status |                   | Agency with address |
|---------|---------------|----------------|---------|-----|-----|----------------------------|--------------------|-------------------|---------------------|
|         |               |                |         |     |     |                            | No. of doses       | Date of last dose |                     |
|         |               |                |         |     |     |                            |                    |                   |                     |
|         |               |                |         |     |     |                            |                    |                   |                     |
|         |               |                |         |     |     |                            |                    |                   |                     |
|         |               |                |         |     |     |                            |                    |                   |                     |
|         |               |                |         |     |     |                            |                    |                   |                     |
|         |               |                |         |     |     |                            |                    |                   |                     |
|         |               |                |         |     |     |                            |                    |                   |                     |

Note : \* Agency — govt/voln/pp  
govt — governmental agency;  
voln — voluntary organization;  
pp — private practitioner

# SURVEILLANCE OF NEONATAL TETANUS

## Sentinel Information System

## I. GENERAL

State \_\_\_\_\_ District \_\_\_\_\_  
 Town \_\_\_\_\_ Hospital \_\_\_\_\_  
 PHC \_\_\_\_\_  
 Report for the month \_\_\_\_\_  
 Total attendance to the clinic during the month \_\_\_\_\_  
 Total number of tetanus cases (other than neonatal) \_\_\_\_\_

## II. NEONATAL TETANUS

## A. Vaccination status of mother

| Area  | Number |        |       | Vaccination status |        |         |
|-------|--------|--------|-------|--------------------|--------|---------|
|       | Cases  | Deaths | LAMA* | 1 dose             | 2 dose | booster |
| Rural |        |        |       |                    |        |         |
| Urban |        |        |       |                    |        |         |
| Total |        |        |       |                    |        |         |

## B. Place and agency of delivery

| Area  | Hospital | PHC | Domicilliary |     |        |
|-------|----------|-----|--------------|-----|--------|
|       |          |     | HW(F)        | TBA | Others |
| Rural |          |     |              |     |        |
| Urban |          |     |              |     |        |
| Total |          |     |              |     |        |

## C. Details of infants delivered by trained personnel/or whose mothers had received 2/booster dose of T T

| Name of guardian | Address | Date of |       | Dose of vaccine |       | Delivery |         |
|------------------|---------|---------|-------|-----------------|-------|----------|---------|
|                  |         | birth   | onset | No.             | Place | Place    | By whom |
|                  |         |         |       |                 |       |          |         |
|                  |         |         |       |                 |       |          |         |
|                  |         |         |       |                 |       |          |         |

Signature of M.O.

Date

\* Left against medical advice



vaccines. In areas where the vaccination coverage is high and none or few cases of EPI diseases have been reported for sometime, sentinel centres may give an early warning if new cases appear.

**C. Active surveillance** of a disease is useful in that it involves the active participation of the health personnel as well as the community and keeps them alert about the priority problems and control measures undertaken. The degree of reporting is more complete than for any other method specially for the clinically distinct and easily recognizable diseases. In districts selected for intensive coverage as well as in other areas where the vaccination coverage is high, active surveillance for poliomyelitis (cases of paralysis in children) and neonatal tetanus (convulsions within 4 weeks of birth leading to death) should be introduced. Since the number of such cases are expected to be few it would be feasible for the local medical officer in charge to examine each child and investigate suspected neonatal tetanus deaths to confirm diagnosis and verify other particulars such as residence and vaccination status. Flash cards have been printed to help the health workers search for cases of poliomyelitis and neonatal tetanus in their areas.

**D. Other methods** for collecting information are investigation of outbreaks and organization of sample surveys.

Investigation of outbreaks of diseases provides useful information but is dependent mainly on the communication system for reporting the outbreaks in time and a machinery for their investigation at short notice. Forms for the investigation of measles outbreak are available with the EPI Section, Ministry of Health and Family Welfare.

Surveys give reliable epidemiological information. Surveys are, however, difficult to conduct and are relatively expensive. The sample size, questionnaires and forms must be well designed to avoid bias and misinterpretation of data. Some diseases require laboratory backup for accurate diagnosis making the surveys even more expensive and difficult.

Sample surveys were organized in 1981 and 1982 to collect reliable baseline data on neonatal tetanus and poliomyelitis for the effective planning and management of the programme and for the future evaluation of the impact of the services.

The surveys were carried out using the 30 cluster sampling technique. States with a population of more than 20 million were

taken up separately. Smaller states were grouped together to form one unit. Union territories were surveyed along with the neighbouring states. Only one division each was covered by the survey in Rajasthan and Uttar Pradesh and two divisions in Madhya Pradesh. Rural and urban areas were surveyed separately.

The survey was carried out by retrospective house to house visits. In each unit a sample of 2000 live births was studied: 67 live births being recorded in each cluster. The survey was limited to children born within a period of one to four months prior to the date of the survey to minimize the risk of missing out any deaths if the recall period was longer. The period was also limited since the accuracy of the diagnosis depended to a large extent on the ability and clarity with which the parents recalled the symptoms during the illness of the child. Particulars of children 5-9 years in each of the households visited were also recorded to determine the incidence of poliomyelitis.

The guidelines for survey were prepared by the Directorate General of Health Services. The surveys were conducted in collaboration with the State health authorities. Three forms were devised for the survey. Form I was used by the health workers for house to house visits in the randomly selected areas. In case the child was born during the survey period, the name of the head of the household, address, date of birth of the child, whether the child was alive or dead, whether the mother was alive or dead, the immunization status of the mother and particulars of delivery were noted. All the deaths within one month of birth were investigated by a medical officer to confirm the cause of death. The relevant information was entered in Form II.

The diagnosis was based on clinical symptoms. With the onset of the disease 3-14 days after birth the child had difficulties in feeding. This was accompanied by spasms and convulsions leading to death. Additional questions were asked by the medical officer at his discretion to differentiate other common causes of fits in the neonatal period. In case of doubt a second opinion was sought. Form III was used for recording the particulars of lame children who were individually examined by a medical officer.

**9.2. Use:** Information collected must be used either for planning or for monitoring and evaluation of the programme. There are five steps to surveillance which must be carried out at

all the levels, starting from the PHC. These are:

- a) Collection of data
- b) Compilation of data
- c) Analysis
- d) Action
- e) Feedback

Investigation is expected to be carried out at least when there is:

- a) report of a larger number of cases as compared to the corresponding period (month or quarter) of the previous year;
- b) sudden increase in the number of cases;
- c) nil reports from areas where the coverage is relatively low;
- d) reported cases in vaccinated children; and
- e) poor downward trend in the disease incidence inspite of improved services.

### **9.3 Submission of reports**

A. Monthly reports on the number of cases and deaths are expected to be sent by the PHC and other reporting units to the district health office, which would compile a report for the district and forward to the state EPI officer. The consolidated state report is expected to reach the Centre by the 25th of the next month.

Reports by the sentinel centres should be sent to the local health office, the state health directorate and the Centre. The active surveillance for poliomyelitis and neonatal tetanus will be coordinated by the State EPI officer who would determine the periodicity of reporting as well as arrange for spot checks.

B. Besides the submission of reports to higher levels, a note may be added on action taken on the basis of the reports or any investigation carried out. In turn feedback would be provided by the state officer to the district and the district officer to the PHCs regarding the status of the programme in other areas.



## **II. PLANNING, MANAGEMENT AND LOGISTICS**

### **1. The Vaccination Services**

As with all other programmes, the success of the immunization programme depends to a large extent on the thoroughness of the plans that have preceded the field operations. The most important aspect of the planning procedure is to determine the disease problems in the area and the age groups that are most affected by the particular disease. This will help to identify the vaccines that need to be used and the ages at which they should be given. The next important step is to determine the resources available and whether more could be mobilized, if necessary. The number of beneficiaries proposed to be covered during the year will depend to a large extent on the availability of supplies and equipment, manpower and communication facilities. The plans should keep in mind the feasibility of the services being sustained over subsequent years and should not be drawn up as a one time effort.

Besides the administration of vaccines, there are other aspects of the immunization programme which need to be well developed and strengthened for the successful implementation of the programme. These include the cold chain for vaccines, the surveillance system, training of health personnel, preparation of health education material and community participation. All the activities of the programme should be regularly monitored and supervised so that corrective action could be taken in time. Job responsibilities must not only be clearly defined but all the people engaged in the programme should know with whom to keep liaison and whom to contact in case of difficulties.

## **2. Organization and Job Responsibilities**

### **2.1 Organization**

The responsibilities of the Central and State Governments in the implementation of the immunization programme are well defined. The Government of India assists the states by supplying vaccines, cold chain equipment and other supplies, prototype health education material, training of senior and mid level medical officers and periodic evaluation. The state health authorities are responsible for providing the immunization services through the existing health delivery systems, maintenance of the cold chain, organization of disease surveillance, training of health personnel and monitoring of the programme.

The work in the states and union territories is co-ordinated by the Centre, who arranges for feedback as well. Annual meetings are held with the officers, in charge of the programme at the state level, to review the work done and finalize plans and strategies for the next year.

The immunization programme is considered an integral part of the maternal and child health services. A functional integration of the two departments has been carried out at the national level and is being implemented in the states.

The immunization services are provided mainly through the hospitals, dispensaries and the maternal and child health centres in the urban areas and the primary health centres and the subcentres in the rural areas. Vaccinations are also performed by outreach operations and campaigns. Visits are made to the schools by the para-medical workers for the immunization of the children. In the metropolitan towns many children are vaccinated by private practitioners.

The coverage of the eligible children and pregnant women needs careful planning. The following criteria are taken into consideration:

- a) the number of eligibles
- b) geographical terrain, accessibility as indicated by communication facilities and state of the roads
- c) manpower and health facilities in the area
- d) availability of resources

With proper planning and management, better use of the existing resources can be made. However, good results can only be achieved if the people involved in the programme know their

job well, are motivated and work in a team spirit. Resources of other governmental or voluntary organizations can be tapped. Many duties can be taken over by them where long specialised training is not required such as health education activities and publicity; preparation of lists of eligibles; follow-up for completion of lists of eligibles; follow-up for completion of full course and reporting of suspected cases of polio and tetanus in their areas.

The plan for the vaccination coverage of the eligible population in the area should include the following:

**2.2 Total number of children and pregnant women** in the area who need vaccination services (for estimation of eligibles see 1-4 page 6) and the proposed vaccination coverage of each group.

**2.3 Determine the manpower** required to carry out the work and allocate job responsibilities to the staff. Ensure that the following tasks are covered:

- a) vaccinations
- b) stores, including vaccines. The person responsible should indent for the required quantities of vaccines and other supplies in time, be responsible for the daily monitoring of the temperature in the refrigerator and for distribution of the vaccines and supplies to the lower formations. He should be able to either procure syringes, needles and other supplies locally or arrange for collection from the higher formation.
- c) monitoring and supervision of services.
- d) preparation and display of health education material, advance man for outreach operations and campaigns for health talks in the community and for arranging vaccination sessions.
- e) recording and keeping reports in order, compilation and analysis of the reports, informing medical officer for action on the reports, forwarding reports to higher formations, providing feedback to the reporting units on action taken.

**2.4 Determine strategies of operation**, that is, whether the services will be provided through fixed centres, by outreach operations or by campaigns. The areas to be covered by each method should be clearly defined.

**2.5 Determine supplies** required, these will include:

- a) vaccines
- b) vaccines carriers
- c) Syringes and needles



- d) sterilization equipment
- e) immunization cards and other forms and records.

**2.6 Determine mobility** required and transport facilities available, including public transport. Bicycles and motorcycles should also be listed if these are available.

**2.7 Assess the cold storage** facilities

- a. cold rooms or hired cold space
- b. total number of refrigerators and number in working order
- c. number of deep freezers in working order
- d. number of vaccine carriers

**2.8 Arrange budget allocation** for

- a. ice
- b. kerosene
- c. POL
- d. travel expenditure of courier
- e. procurement of syringes, needles, sterilization equipment and other supplies.

**2.9 Determine training** needs

**2.10 Determine availability** of health education and publicity material

**2.11 A. Determine feasibility of surveillance activities** by

- a. routine reporting of cases and deaths
- b. sentinel centres
- c. active surveillance of polio and tetanus

**B. Determine action to be taken on the reports**

Prepare a list to whom reports should be forwarded as well as of those to whom feedback should be provided.

**2.12 Determine expected impact** of the services and methods and period of evaluation.

**3. Strategies of Operation**

Depending upon convenience and facilities available different strategies are adopted to cover the children and pregnant women. These include fixed centres approach, outreach

operations and campaigns. Since the vaccination services are not a one time effort the plans are made with a view to the feasibility of their being repeated during subsequent years. The services once started, cannot be withdrawn.

### **3.1 Fixed centres**

All the places which provide health services and have adequate cold storage arrangements, i.e. a reasonably reliable electric supply and a working refrigerator, must be identified. If vaccination services are not already available, the possibility of doing so must be considered. All vaccines should be available at each centre so that the children do not have to visit different places for different vaccines. Vaccination sessions may be organised daily, bi-weekly, fortnightly or monthly depending upon the attendance to the clinic. A minimum of ten children per session are considered necessary to make it economically viable. The day and time of the vaccination session should be prominently displayed and all efforts made to hold the sessions regularly as scheduled.

### **3.2 Outreach operations**

Vaccines have to be carried and vaccination sessions organised by the para medical staff in the villages which are beyond a radius of 5 km. from the centre especially in places with poor communication and transport facilities. For effective implementation the following steps are suggested:

- i) Contact the community leaders and explain the need for the early immunization of children and of pregnant women. Fix a date and time mutually convenient.
- ii) Select a site for the vaccination session. If an appropriate building (such as a school or a community centre) is not available a cool shady place may be chosen. The site should be freely accessible to all the members of the community.
- iii) Arrange for the preparation of the list of eligible children and pregnant women in the area and for their collection at the selected site on the day of the vaccination session.
- iv) Carry the vaccines for the day's use in a vaccine carrier. The ice packs in the vaccine carrier should be fully frozen. If a thermocole box is used it should be well packed with ice.
- v) Vaccines not used during the day should be returned to the

nearest health centre on the same day or latest by next morning for storage.

- vi) Arrange for repeat visits. The interval between the visits should ideally be 4 to 8 weeks; it should not be less than one month.
- vii) All efforts must be made to hold the sessions on the fixed days. If this is not possible for some reason the villagers must be informed in time and the date for the next session fixed.

### **3.3 Campaigns**

Campaigns are organized during the winter months in areas which cannot be covered either through the fixed centres or by outreach operations. Teams of health workers move from village to village carrying adequate quantities of the vaccines and other supplies. As for the outreach operations prior ground work must be done to make the exercise a success. Since a large number of villages are expected to be covered within a short period of time and the distances to be covered from the health centre are also greater, village-wise time schedule and the mode of transportation must be clearly chalked out in advance. Active community participation would greatly facilitate the work. The village leaders should be encouraged to keep the list of eligible children ready and collect them at the vaccination site on the prefixed day and time. Arrangements for repeat visits must be made at an interval of 4 to 8 weeks.

Proper and good planning and management are necessary to make the maximum use of the available resources and to lead to a greater impact on the disease incidence. It is aimed to expand the coverage in a phased manner to 85 to 100% of the eligible population by 1990. This target is proposed to be achieved by 1985 in at least one district in each state. In these districts, it is aimed :

- i) To immunise 85% of the eligible children between 3 to 12 months with 3 doses each of DPT and polio vaccines and 85% of the pregnant women with 2 doses of TT. The infants with BCG and school children are to be vaccinated as planned under the routine programme.
- ii) To reduce the incidence of poliomyelitis to less than 0.33 per 1000 children 0-4 years by 1985.
- iii) To reduce the neonatal tetanus mortality rates to less than 0.5



per 1000 live births in the urban areas and less than 1.0 per 1000 live births in the rural areas by 1985.

- iv) To chalk out cost-effective methodologies of implementation for application in other areas in future.

#### **4. Performance problems**

In spite of best planning, things can still go wrong. The reasons for this must be looked into carefully since corrective action cannot be taken till the problem has been identified.

As the flowchart (Fig. VIII) shows, the three major areas to be investigated are:

4.1 The capabilities of the health personnel. Are they capable of doing the job they have been asked to do ? Have they been trained adequately and can the job be simplified ? Is the health worker aware that he is not doing the job correctly ?

Problems related to work not being done correctly due to inadequate or incorrect knowledge can be solved by simplifying the task if possible, arranging for on-the-job training, supervised practice and reorientation courses.

4.2 The work will not be done satisfactorily if the health workers lack motivation. Very often a worker is punished for doing good work by being loaded with more work sometimes not related to his direct job responsibilities; while a bad worker may indirectly get rewarded by being given very little work. Unreliable workers may also be able to avoid field duties since the team leader would like to assign the responsibility to a person who will not only do the work but also do it well. Many times no distinction is made between good and bad workers and therefore there may be no incentive for the workers to do better. In places where the team leader (M.O., PHC for example) is indifferent to the immunization programme, the staff soon lose their motivation to do well.

4.3 The proposed plans and targets should be realistic. Adequate facilities and equipment should be provided to do the work.

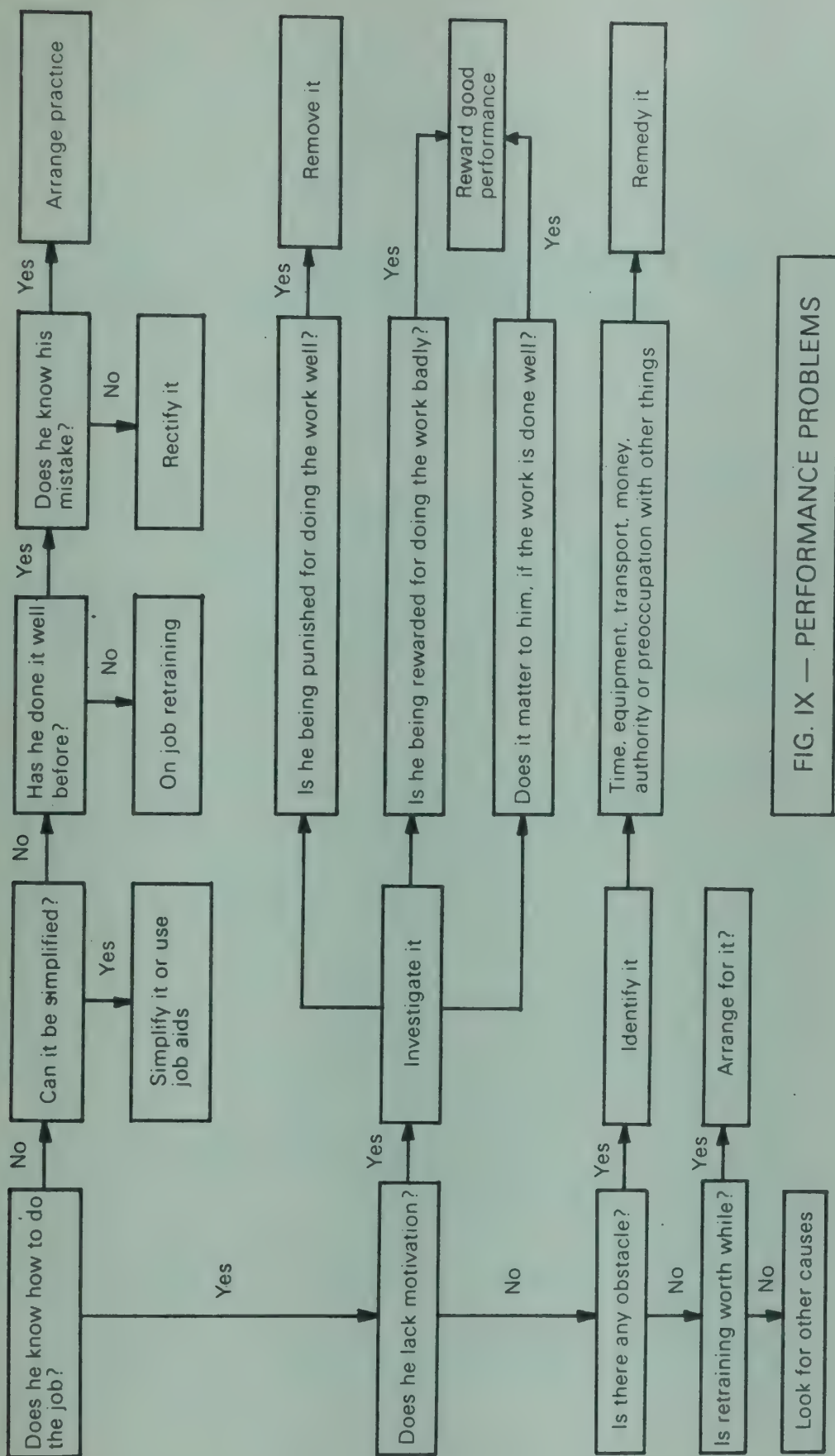


FIG. IX — PERFORMANCE PROBLEMS

### **III. COMMUNITY INVOLVEMENT AND HEALTH EDUCATION**

#### **1. Health Education**

Active participation of the community is necessary for the successful implementation of the programme. The health education activities are directed at the health workers, other non-medical professionals and the community at large, with special emphasis being given to the mothers. The assistance of the community leaders including elders, school teachers and private practitioners is sought for the programme.

Opportunity should be given to the health workers to ask questions and clarify their doubts because unless they are clear in their own minds, it will be difficult for them to communicate the information to the public. If a formal reorientation course is not feasible or desired, short briefing sessions may be held. Monthly meetings should be utilised for imparting information or clarifying their doubts.

The following topics may be included in the briefing sessions :

- a. what are the diseases that are preventable by immunisation and why it is important to control them;
- b. the major signs and symptoms of these diseases;
- c. the immunisation schedule. Stress the need for completing the full course at the right age;
- d. expected reactions and conditions when vaccinations may be postponed;
- e. how to conduct health talks and encourage community participation;
- f. expected benefits of the programme.



## **2. Community participation**

The reasons for the poor participation by the community can broadly be classified into three categories :

### **2.1 Lack of information**

- a. about the severity of the diseases or the complications they can cause;
- b. that these diseases can be prevented;
- c. that the services are available in their areas;
- d. time and place of vaccination sessions;
- e. age at which vaccinations are required and the need for completing the full course.

### **2.2 Lack of motivation**

- a. no faith in vaccination services;
- b. belief in traditional methods;
- c. rumour about ineffectiveness or harm;
- d. poor service and/or discourteous behaviour of staff;
- e. fear of side reactions.

### **2.3 Obstacles**

- a. vaccination centre too far;
- b. time not convenient;
- c. inconvenient or expensive to travel to the centre.

Since the reasons may differ from place to place these must be looked into if there is a poor response from the public. It has generally been found that this is either due to lack of information or the time and place not being convenient. Courteous and efficient services will encourage community participation. The programme should be monitored to see that there are no reactions due to improper sterilisation of syringes and needles or wrong technique of administration of vaccines.

The health education sessions should be conducted in a language and content easily understood by the local people. The person conducting the health talks should be experienced, knowledgeable and motivated. For passing on simple messages, however, all members of the health team, including dais, anganwadi workers, and community health volunteers should be used.

Posters on the diseases and immunization schedule should be placed at strategic points. Teaching and publicity aids should be provided.

## **IV. IMPLEMENTATION**

### **Organisation of vaccination sessions**

1. Fix the day and time of vaccination sessions. This should be prominently displayed at the fixed centres. In case of outreach operations, advance information must be given to the concerned people.

2. Arrange the place for vaccinations. There should be at least one table and two chairs. There should be nothing else on the table except the things that will be used during the session.

It is preferable to have two doors in the room—one for entry and the other for exit, so that there is no haphazard movement of the people and confusion in the room. During outreach operations, choose a cool shady place if no room is available.

If possible make arrangements for seating the people outside the room used for vaccination.

3. Sterilize the syringes and needles sometime before the session is to start since they will take a while to cool. Rinse and clean before boiling. Boil for twenty minutes. Start counting the time after the water has started to boil. Use the syringes and needles only after they have cooled. Use a sterilised needle for each vaccination. The syringes and needles should be picked up by sterilised forceps. Do not touch with unwashed hands or keep on an unsterile surface.

4. Screen children to see that they are in the age groups recommended for vaccinations and that they are not seriously ill. In case of doubt the child should be examined by a medical officer.

5.1 Infants are given three doses each of DPT and polio vaccines and 1 dose of BCG. DPT and polio vaccines are given together. BCG vaccine can be given with any one of the three doses, but the sites of the injections should be different. DPT

vaccine is given intra-muscularly, BCG—intradermally. Polio vaccine is given by mouth. The dose of DPT and polio vaccines is 0.5 ml and of BCG vaccine — 0.05 ml.

The minimum number of visits a child would have to make to complete the course of vaccinations would be three. One more visit is necessary 12 to 18 months later for the booster doses of DPT and polio vaccines.

5.2 School aged children are given DT, typhoid and TT vaccines. The dose of each vaccine is 0.5 ml. DT and TT vaccines are injected intramuscularly and typhoid vaccine subcutaneously.

5.3 Pregnant women require TT vaccine by intramuscular injection.

| To whom        | Vaccine | No.    | Route          |
|----------------|---------|--------|----------------|
| Infants        | DPT     | 3 + 1* | Intra-muscular |
|                | Polio   | 3 + 1* | Oral           |
|                | BCG     | 1      | Intra dermal   |
| Children       | DT      | 1**    | Intra-muscular |
|                | Typhoid | 2      | Subcutaneous   |
|                | TT      | 1**    | Intra-muscular |
| Pregnant women | TT      | 1**    | Intra-muscular |

\* booster dose

\*\*give two doses if not vaccinated previously.

#### NOTE :

- Interval between doses should not be less than one month.
- the dose of all vaccines is 0.5 ml. except BCG which is 0.05 ml.
- wash hands before the sessions and keep the place of the vaccination sessions clean.

6. Open only one vial of each vaccine at a time. The opened vials should be kept in a cup of water with ice or on an ice-pack while using. Take care to see that the vials are not exposed to heat or sunlight. Unused vials should not be taken out of the refrigerator or vaccine carrier. Check expiry date.

7. The typhoid vaccine supplied under the immunisation programme for school children is diluted. The dose of this vaccine is 0.5 ml. This vaccine should not be given to adults.



8. The diluent used for reconstituting BCG vaccine should be cooled before use.

9. Keep a record of the vaccinations done during the day in a register at the centre. These should include the name and address of each child, his age, the type of vaccine and the number of dose. Note the batch number and the expiry dates of the vaccine vials used during the day.

Entries should also be made in the immunisation card which is handed over to the guardian of the child.

10. Inform the parents about the date of the next visit. Impress the need for completing the full course. Inform them that the vaccines will protect their children only if all the doses have been given. Tell them about the expected reactions. Reassure them that you are there if they need your help.

11. Wash syringes and needles after use thoroughly with water.

12. Clean up the site in case of outreach operations. Inform the community of the date of the next visit.

## V. INFORMATION AND EVALUATION

### 1. Records and reports

Minimum records : The minimum records required to be kept in the immunization programme are :

- a. records of vaccination by age and dose.
- b. record of cases and deaths.
- c. records of vaccines received and utilized during the month.
- d. refrigerator temperature record.

#### 1.1 Vaccination performance

The record of the vaccinations done during the day should be kept in a register at the centre. This should include the name of the child, his address, age, type of vaccine given and the number of dose.

The batch number(s) and the expiry dates of the vaccine vials used during the day should be noted.

The total number of vaccinations performed dose-wise should be compiled for each vaccine and forwarded to the next higher level within the prescribed time period. If reports are received late from one or more units, follow-up action should be taken to ensure that all these units send their reports in time.

Entries of vaccinations should also be made in the immunization card which should be handed over to the guardian of the child.

#### 1.2 Cases and deaths

A record of the cases and deaths due to diseases preventable by immunization should be available at the centre. This will normally include only cases which have reported for treatment.

Neonatal tetanus and tetanus in others should be reported

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separately. Poliomyelitis should include only cases who developed the symptoms during the year of the report and should not include cases of residual polio paralysis.

In areas where the vaccination coverage is highly and consequently the number of cases few, attempt should be made to search out any cases in the area actively.

The consolidated list of the cases and deaths for the month should be forwarded to the next higher level. (Form IV, pages 53 and 54).

### **1.3 Vaccine stocks**

The number of vials received vaccine-wise with batch numbers and dates of expiry must be recorded in the register. The actual quantities of the vaccines used should be reconciled with the utilization reports (total number of vaccinations reported +10%). The stock in hand at the beginning of the month, quantity of vaccine received, amount utilized and the balance on the first of the next month must be included with all indents for more vaccine.

### **1.4 Refrigerator temperature record**

The temperature in the refrigerator should be recorded twice daily. The record should be available for inspection by the supervisors. This form need not be forwarded to the district or the state. (Form I page 17)

## **2. Supervision of activities**

One of the primary responsibilities of the medical officer of the PHC is to supervise the work being done by the staff. The objectives of the programme will not be achieved if certain tasks that should be done are either not being done correctly or not being done at all. It is necessary to observe frequently the work of the staff in the field and to study carefully the reports submitted by them.

The purpose of supervision is to reinforce correct performance and to identify and correct inadequate performance.

Supervision means not only to pinpoint the problems in time so that corrective action could be taken but also to assist the staff and help them in case of difficulties. Opportunity should be given to the staff to clear their doubts if there are any. Written job descriptions, thorough briefing and a coordinated team work will



# INTENSIVE IMMUNIZATION PROGRAMME

Month \_\_\_\_\_

STATE \_\_\_\_\_

DISTRICT \_\_\_\_\_

No. of reporting units \_\_\_\_\_ Urban \_\_\_\_\_ Rural \_\_\_\_\_

No. of reports received \_\_\_\_\_ Urban \_\_\_\_\_ Rural \_\_\_\_\_

## SURVEILLANCE

| Disease               | Reported      |        |                        |        |
|-----------------------|---------------|--------|------------------------|--------|
|                       | For the month |        | Cumulative since April |        |
|                       | Cases         | Deaths | Cases                  | Deaths |
| Diphtheria            |               |        |                        |        |
| Pertussis             |               |        |                        |        |
| Tetanus neonatorum    |               |        |                        |        |
| Tetanus others        |               |        |                        |        |
| Poliomyelitis (acute) |               |        |                        |        |
| Tuberculosis          |               |        |                        |        |
| Typhoid fever         |               |        |                        |        |

## VACCINATION PERFORMANCE

|         | Vaccine | Dose | Performance | Cumulative since April |
|---------|---------|------|-------------|------------------------|
| INFANTS | DPT     | 1    |             |                        |
|         |         | 2    |             |                        |
|         |         | 3    |             |                        |
|         |         | b    |             |                        |
|         | Polio   | 1    |             |                        |
|         |         | 2    |             |                        |
|         |         | 3    |             |                        |
|         |         | b    |             |                        |
|         | B.C.G.  | 1    |             |                        |

# CHILDREN

|                 |   |  |  |
|-----------------|---|--|--|
| D.T. (presch)   | 1 |  |  |
|                 | 2 |  |  |
|                 | 1 |  |  |
|                 | 2 |  |  |
|                 | b |  |  |
|                 |   |  |  |
| D.T. (5 Years)  | 1 |  |  |
|                 | 2 |  |  |
|                 | b |  |  |
| Typhoid         | 1 |  |  |
|                 | 2 |  |  |
| T.T. (10 Years) | 1 |  |  |
|                 | 2 |  |  |
| T.T. (16 Years) | 1 |  |  |
|                 | 2 |  |  |
| T.T.            | 1 |  |  |
|                 | 2 |  |  |
|                 | b |  |  |

## PREGNANT WOMEN

### VACCINE SUPPLY (no. of doses)

| Vaccine | Stock in hand | Received | Used | Balance |
|---------|---------------|----------|------|---------|
| D P T   |               |          |      |         |
| Polio   |               |          |      |         |
| BCG     |               |          |      |         |
| D T     |               |          |      |         |
| Typhoid |               |          |      |         |
| T T     |               |          |      |         |

### REFRIGERATORS (number)

|               |             |               |
|---------------|-------------|---------------|
| District Hdq. | Total _____ | Working _____ |
| PHCs          | Total _____ | Working _____ |

### UNTOWARD REACTIONS

reported . Abscesses \_\_\_\_\_ Others \_\_\_\_\_

DISTRICT HEALTH OFFICER

DATE :

- To,
1. The Assistant Director General, (EPI), Ministry of Health and Family Welfare, Nirman Bhawan, New Delhi 110 011.
  2. State E P I Officer

no doubt go a long way in the efficient implementation of the services.

Some of the points that need to be monitored are given below :

| Point                | Method  | Indicator of problem  |
|----------------------|---|---|
| 1. Number vaccinated | Check register<br>spot checks                 | * Achievement less than the proportionate target.   |
| 2. Age               | —do—  | * More than 10% of the children given DPT and polio vaccines above 23 months of age.  |
| 3. Drop out rate     | —do—  | * Drop out for the first to the third dose more than 15%.   |
| 4. Utilization       | Check vaccine stocks                          | * Vaccination utilization less than estimated by performance reports.   |
| 5. Stocks            | Check register<br>Verify stocks               | * More than one month's requirements at PHC.<br>* More than three month's requirements at district and state stores.<br>* Nil stocks at district and state stores.<br>* Date expired vaccine.   |
| 6. Storage           | Check temp. record form<br>Check refrigerator | * Temperature record not maintained.<br>* Frequent rise in temperature above 8°C<br>* Door frequently opened by unauthorised personnel.<br>* Thick layer of ice around freezing compartment.<br>* Vaccines stacked haphazardly.<br>* Vaccines kept in the door. |



| Point           | Method  | Indicator of problem  |
|-----------------|---|---|
| 7. Distribution | Check records<br>Question staff<br>observation. | <ul style="list-style-type: none"> <li>* More vaccines taken to the field than daily requirement.</li> <li>* Less vaccines taken to the field than daily requirement.</li> <li>* Ice packs not frozen completely.</li> <li>* Ice not sufficient.</li> </ul>   |
| 8. Session      | Observation<br>Discussion                       | <ul style="list-style-type: none"> <li>* Attendance less than expected.</li> <li>* Session dates changed frequently and without notice.</li> <li>* Unsterilized equipment used.</li> <li>* Disorderly movement of people.</li> <li>* More than one vial of same vaccine opened at one time.</li> <li>* Vials not kept on ice/ cup with iced water while in use vaccines exposed to direct sunlight</li> <li>* Community not informed about immunization schedule expected reactions or date of next visit.</li> <li>* Impolite behaviour of staff.</li> <li>* Correct technique for vaccine administration not followed.</li> </ul> |
| 9. Reactions    | Question<br>Examination<br>of children          | <ul style="list-style-type: none"> <li>* Abscesses.</li> <li>* Severe reactions.</li> </ul>   |

| Point      | Method  | Indicator of problem                     |
|------------|---|--|
| 10. Impact | Check records,<br>Question staff and community,<br>Examination of children. | * Reported cases in vaccinated children. |

### 3. Evaluation of services

Evaluation is a process by which the success of the programme is assessed. It is to determine whether the objectives laid have been achieved. Evaluation is important because it allows the EPI coordinators to determine if they are doing what needs to be done, if their programme is making progress according to plan, and helps to identify what needs to be changed to make the programme work better.

Although the quality of services must be evaluated and each major aspect such as cold chain system, surveillance, health education etc. must be studied in detail, two criteria have been laid down for the overall evaluation of the services :

- a. Vaccination coverage of the eligible population
- b. Reduction in the incidence of poliomyelitis and tetanus

#### 3.1 Vaccination coverage

- i) Monthly reports forwarded by the units are compiled. The information received is analysed to find out whether the target planned has been met. The drop out rates are also checked.
- ii) The routine reports do not give any information about the age of the children at the time of vaccination. Vaccinations given from sources other than the government centres are also not included. In order to collect more reliable data vaccination coverage assessment surveys are organised in selected places. The standard 30 cluster sampling technique is followed and vaccination history of children between 12 and 23 months of age is taken.

The results of such surveys will be particularly useful if they are coupled with an investigation and recording of the cold chain system. The temperature records of the refrigerators in the area used for storing vaccines must be particularly checked.



### 3.2 Impact on disease reduction

Vaccination of a large number of people will in itself not lead to a reduction in the number of cases of the particular diseases if the vaccines were either not given at the right age, or were given in less quantities than required or if the vaccines were made ineffective due to exposure to excessive heat or cold.

Places reporting high vaccination coverage should be evaluated to study the impact of the services provided. The routine reports of cases and deaths and the reports from the sentinel centres should be studied carefully to see if there is any change in trend of the diseases.

Active surveillance may be started for diseases which are clinically distinct and easily recognisable such as poliomyelitis and tetanus. The community should be encouraged to report cases of the diseases. The cases must be examined by a medical officer to confirm diagnosis and provide treatment where indicated.

Annual independent check for poliomyelitis and possibly tetanus should be made by visiting at random some of the villages or wards and enquiring of any children who had poliomyelitis or tetanus over the last 12 months from the local medical officers and village elders.

### 3.3 Potency tests

Random samples of vaccine vials are collected from the field by the Central officers for potency tests. Since the tests are expensive and time consuming the number of samples are understandably few.

